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MEMBER AUDIT BUREAU OF CIRCULATIONS

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HOUSTON OFFICE
Sixth floor Goggan Bldg.....Phone Preston 159

NORTH TEXAS OFFICE
502-3 Boger Bldg., Phone X6779.....Dallas, Texas

OKLAHOMA OFFICE
225 Atco Bldg., Phone Osage 1844.....Tulsa, Okla.

WASHINGTON BUREAU.....622 Albee Building

R. L. DUDLEY.....Manager and Editor
C. E. GIRTEN.....Vice President
W. E. GREEN.....Associate Editor
SILAS B. RAGSDALE.....Associate Editor
B. V. ELLZEY.....Associate Editor, Mgr. Okla. Office
J. F. CARTER, Jr.....Business Mgr. N. Texas Dist.
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The Texas & Pacific Coal & Oil Company has a 500 barrel producer on Stuart tract in Palo Pinto. This and other wildcat completions on page 91.

Now that THE OIL WEEKLY has pointed out the way and has twice printed the itemized list of oil production in Oklahoma, watch the other oil publications fall on it like a long lost friend. *"We lead—others follow."*

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THE OIL WEEKLY

HOUSTON DALLAS

ESTABLISHED 1916 VOL. XIX—NO. 4

MEMBER AUDIT BUREAU OF CIRCULATIONS

Topping Plants and the Market Situation

Autumn Prices Cut the Margin of Profit But Outlook Is Not Dark

By B. V. ELLZEY

AUTUMN prices on refined oils, that have come three weeks ahead of schedule this year, because of the impetus given August deliveries by the freight rate advance at the close of that month, have narrowed the margin of profits to the topping plant operator, and this condition is being reflected in the Mid-Continent by the shutting down of some plants, and the curtailment of production by others.

The usual fall slump in gasoline does not materialize before about October 15. This year it was manifest by September 25. Refiners and marketers believe it came early as a result of the jobbers stocking up prior to the freight advance.

However, it was a normal price movement. It narrowed the profits of topping plants, and where premiums are being paid for crude, it wiped out the existence of the profit column. Its effects had been contemplated by refiners who had seen practically the same thing happen in previous years; but the fact that the decline was ahead of schedule this year has worked a temporary hardship that is not usually felt by the autumn weakening in the price of motor fuel.

The Usual Offset

To offset the decline in gasoline each fall, the prices of fuel oil, gas oil and kerosene usually strengthen. This condition creates a balance, which permits topping plant operators to continue to operate with profit. The schedule was upset this year because the gasoline decline came ahead of the fuel and kerosene advance, and has created a temporary soft spot which is being magnified by those who can see only the temporary side of any condition.

The matter would indeed be serious should fuel oil and kerosene not make their usual seasonal advances. That they will soon advance is confidently expected by the trade.

In the meantime, the topping plant is being run at a close margin, if at all. Some plant owners who have their own production see more money in shutting down their plants and selling their crude to the purchasing agencies. Others have temporarily cut production from their plants, while still others are continuing to run at capacity, and sell their stuff to whatever advantage they can. This latter class represents a very small percentage of the refiners. Many plants that are running at capacity, especially the larger ones, have their output sold under long term contracts, at prices based on the Chicago tank wagon market, and are therefore in as good position now as they have been at all.

As a matter of fact, the Standard companies take care of 60 per cent of the oil that is refined in the Mid-Continent, including North and West Texas and Louisiana, and much of the stuff it buys is on term contracts, at prices that are determined by the tank wagon market. If the price-making interests were disposed to "put the independent out of business," as the calamity howler would have the trade believe, they would only have to lower the tank wagon market to a point where the independent could no longer exist. That this has not been done, goes without saying. Right now, when gasoline and kerosene are weaker in the market than they have been since the same season last year, the tank wagon prices have not changed. It is realized that only two months' supply of oil is above ground, and that it will require concerted action by all refiners to accumulate enough motor gasoline for the next summer's demand. Only a slashing to pieces of the price schedules by irresponsible and disconnected independent refiners could bring about a very material reduction in the retail price of refined oils.

As a temporary condition, however, many independent topping plant operators are asking themselves the question, "How far down the scale can the prices go, and still allow the topping plant to operate at a profit?"

How Far It Can Go

The following analysis may throw some light on the question:

Average Mid-Continent crude oil makes about 14 gallons of gasoline to the barrel of 42 gallons of crude. It makes 6 gallons of kerosene and 19 gallons of fuel oil. Where the gasoline output is higher, the kerosene output is lower, and vice versa. These figures therefore are typical, for the topping plant.

One barrel crude, 42 gallons, makes:

14 gal. gasoline, at 20 cents a gallon	$2.80
6 gal. kerosene at 9 cents a gallon	0.54
19 gals. fuel oil at 6 cents a gallon	1.14
	$4.48

(Prices used here are October 18 quotations on car lot sales, with fuel oil at $2.52 a barrel of 42 gallons.)

One barrel of crude, refined, costs:	
Crude oil, schedule price	$3.50
Gathering charge (transportation)	0.25
Processing (labor, overhead, etc.)	0.50
	$4.25
Profit on barrel of crude	23 cents

Premium Wipes Out Profit

It should be noted in this analysis that no allowance is made for the premium on the crude, and the figures are based on the assumption that the refinery is located near the point of production of the crude; otherwise the transportation charges on the crude will mount up rapidly. When the premium is added to the cost of the crude, the profit is wiped off the board. Up to a month ago it was customary for Mid-Continent refiners to pay a premium running from 15 cents to 35 cents on ordinary crude. In the Garber field, the crude produces 60 per cent gasoline, and a heavy premium is always paid; but this is exceptionally high gravity oil, and cannot be distributed to many refiners because of the limited output of the field.

It will be seen that the situation at the present time is not encouraging; that a sharp advance in the price of fuel oil or kerosene, or both, is necessary at an early date to maintain the profitable operation of the topping plant, especially where such plant is paying a premium for crude oil.

With only two months' supplies of crude oil above ground; with the price of automobiles being reduced all along the line; with the adoption of motor power more and more in agricultural and transportation enterprises, it is likely that an even greater supply of gasoline will be required in 1921 than has ever been used before in a similar period. This necessitates storing gasoline during the winter months, and suffering whatever loss may be necessary from evaporation and depreciation, and assuming fire and explosion risks on it, to say nothing of involving an enormous fortune in holding the gasoline till next season, and that at a time when money is hard to get.

Refiners as a rule do not care to see crude reduced in price. If they can operate under present price schedules, they prefer to see the producer protected, and enabled to continue his efforts to keep a supply of crude oil coming from the earth. A general curtailment in the price of crude at present would demoralize drilling campaigns, and ten months from now would bear its fruit in a general shortage of petroleum products. The pipe line companies and purchasing agents are as patriotic as any one else. They would gladly see the prices of all commodities reduced to a normal basis, petroleum products along with the rest. But a reduction of the price of crude oil at this time would only mean that an ultimate shortage of petroleum products would follow in its wake, and that the law of supply and demand would ultimately cause a higher level of prices than at present prevails. The only sound economical basis on which a general reduction can be made is that it be accompanied by a corresponding reduction in the cost of labor, materials, transportation, and everything that enters into the cost of production.

What the Effect Would Be

Unless such reductions are made simultaneously, the producer will naturally be forced to limit his operations to activities which have no risks involved, and to properties that can be operated most economically. There could be but one result: a dropping off in the amount of oil produced. That could have but one effect: a scramble for crude by the refiners and purchasers, to supply an ever increasing demand for refined products over long periods of time. An inflation of prices that would accompany such a competitive market situation would kill the effect of the original reduction in prices, and would react against itself to the detriment of the producer and refiner, as well as to the consumer of any product of petroleum.

The present market situation can only be understood by taking a composite view of the whole structure of factors determining the market, and without isolating one particular season or one particular condition, or territory. There is ample cause for encouragement to the refiner or producer who takes such a view of theindustry at this particular time.

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Zacamixtle Wildcat Well Bridged and Flow Is Rather Small

HOUSTON, TEXAS, Oct. 20.—The wildcat well in the Zacamixtle district in Mexico has bridged around 2427 feet and for this reason the production of the well is small. The well, however, has all the "ear marks" of a big producer and the gas pressure seems strong, according to the reports. Estimates as to the daily production vary from 1500 to 8000 barrels, acurate figures being impossible, as the well is flowing by heads because of the bridge. Late reports state that attempts are being made to clean out the hole. The total depth of the well is about 2580 feet. When the well came in the oil shot 60 feet over the top of the derrick before it was shut in. It was brought in by Harry Coupe and T. A. Reynolds, two of the best drillers on the Huasteca staff.

Operators in Mexico are jubiliant over the completion of the well as millions of dollars have been spent on that district when there was not a producer in the field. The well is located in the west end of lot 24 Zacamixtle, just northeast of the town of Zacamixtle or in the northwestern section of that district. Drilling on other wells is in progress on lots 25 and 26 adjoining lot 24 on the south and on lot 23, adjoining lot 24 on the north. The Laja river forms the northern boundry of lot 23 as it does for the entire Zacamixtle district. Across the river from lot 23, three tests are going down on lots 231, 229, 230 and 226 Amatlan, with several other wildcat tests in southern Amatlan from the Laja river to Los Naranjos in the proven teritory. Tests are being made at the lower extremity of the Zacamixtle district, one being made on lot 58, adjoining northeast of lot 59, the southwestern boundary of which forms part of the southern boundary of the district. The town of San Francisco, in lot 57, is due north of this test. Two tests are being made in the southeast corner of the Toteco district, which lies immediately west of Zacamixtle. These two tests are almost due east of the test on lot 58 Zacamixtle.

Five tests are being made along the western boundary of Solis, adjoining Zacamixtle on the south. These tests lie on a line with the tests on lots 25 and 26 Zacamixtle and the new producer on lot 24, except of course, much farther south.

Texas-Louisiana Division Oil and Gas Association to Meet Saturday

DALLAS, TEXAS, Oct. 20.—Wichita Falls has drawn the second annual meeting of the Texas and Louisiana division of the Mid-Continent Oil and Gas Association. The meeting will be held there Saturday, October 23, according to invitations just sent from the office of Howard Bennette, the secretary, here.

Both members and non-members of the organization are being asked to attend. The invitation list has been prepared from the quarterly production statement filed with the state comptroller.

Following is a paragraph from the invitations mailed to non-members: "We realize that you are not a member of the association, but we are inviting you to be present at both our annual meeting and banquet, so that you may advise with us on the many questions that will be considered."

The entertainment is being arranged by members who live in Wichita Falls. Features will be visits to nearby fields and the banquet in the evening following the meeting. The banquet will be held at the Wichita Club rooms.

Committees are as follows: Arrangements, R. O. Harvey, chairman; W. H. Priddy, G. Clint Wood and J. I. Staley. Entertainment, C. H. Clark, chairman, C. E. Rodgers, J. W. Chatham, Jr., J. A. Gardner and W. Newton Maer

Additional Pullmans are being run from both Fort Worth and Dallas to accommodate the crowds.

The annual membership meeting will be held at 4 o'clock in the afternoon in the court house. A new executive committee is to be selected at this time.

The program for the meeting has not been completed. Several men prominent in the petroleum industry are to speak. There will be special entertainment features for the banquet in the evening.

Humble Oil & Refining Company heads of departments who were in Houston for a conference. The picture was taken at the Humble's new refinery at Bay Town on the Houston Ship Channel. Sitting (left to right): Bert Broday, W. J. Hanna (since deceased), W. A. Eberle, J. K. Vaughan, C. M. Husted, L. H. Attwell, Jr., R. S. Sterling, A. J. Clark, James Anderson, Jr., R. V. Hanrahan, Carl Buerbaum, J. Perry Moore, J. H. Hill, Harry Edwards, Carl Carroll, Joe Maloney, H. J. Thompson, M. F. Moffett, B. R. Meadows. Standing (left to right): Tom Maloney, D. B. Harris, H. C. Applegate, D. H. Freel, H. N. Pardee, W. S. Farish, George B. Reeger, W. J. Armstrong, W. R. Styron, A. O. Behling, M. B. Stanton, A. O. Stovall, Captain Frank Downs, R. L. Schneider, A. M. Bowman, T. H. Hamilton, C. E. Bates, R. E. Sinclair and F. N. Reed.

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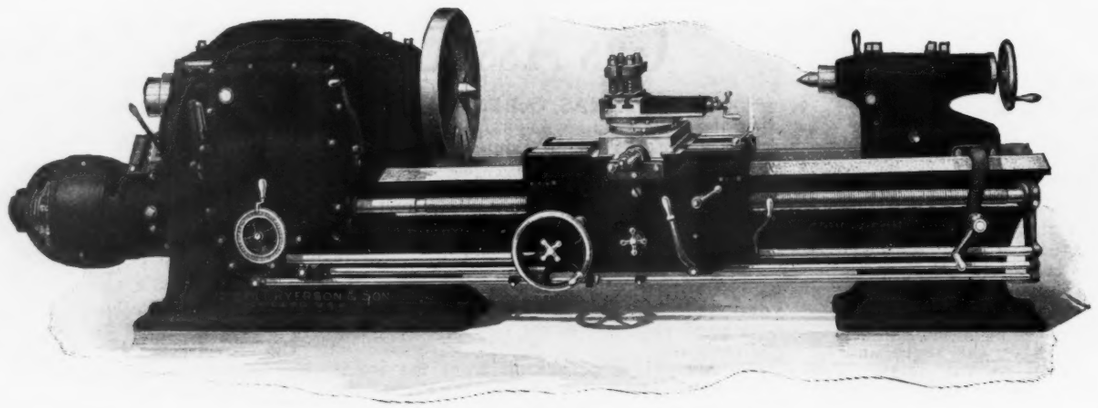

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Field in Argentina Is Extended by No. 99 Good for 180 Barrels

BUENOS AIRES, Sept. 16.—(By Mail)—An important extension of the producing areas in the Comodoro Rivadavia oil field was made last week when well No. 99 was brought in at a distance of 3700 meters from the nearest production. Oil was found at 581 meters. In quality it is heavier than that in the principal parts of the field, and there is very little gas. Daily average production from the well has been in the neighborhood of 25 tons (180 barrels).

The bringing in of this new well is the result of the government's policy of exploring the entire reserved area. Further borings are going on in untested parts of the field, and it is expected that they will greatly extend the productive area. While the new well is 3700 meters from the nearest production it is about 5500 meters from the working zone of the field.

Interesting new figures on this field have been published as a result of a special report made by the Minister of Agriculture, who has charge of the work, to the Chamber of Deputies. According to these figures, from January 1, 1910, to October 11, 1916, the production of the national enterprise was 251,021 cubic meters, and from October 12, 1916, to August 31, 1920, it was 738,087 cubic meters in addition to a production of 60,847 cubic meters by private companies. The amount of reserve oil on hand on the latter date was 42,497 cubic meters. The total value of this production in the first period was $4,951,626, Argentine paper, and in the second period was $39,337,432, paper, $17,308,470 gold.

The official enterprise at the present time is operating 102 wells with a monthly production of approximately 21,000 cubic meters, or an average of 205 cubic meters per well. In the months of March and April, 1917, the production reached its maximum due to the success of wells 39 and 50 which came in at that time and which were the best the field has developed. Production during those months reached 21,221 and 23,413 cubic meters respectively, but by September of the same year this had fallen to 13,875 cubic meters.

The value of the assets of the national enterprise have tripled since 1916. In December of that year assets amounts to $13,577,366.79 while in December, 1919, they were $37,882,948.73. Reserve funds during the same period increased 1000 per cent.

The Rivadavia reserved oil lands total 163,000 hectares of which approximately 50,000 hectares are included in the plans of the present workings. Within this section several private companies have been granted rights of exploitation. The regulations for granting permission to private companies for developing oil lands provide that no concession shall be made on lands within 5 kilometers of any oil well.

In the new oil field in Neuquen at Plaza Huincul station the government has reserved 7,858 hectares. Another reservation will probably be made shortly as a result of investigations which have been going on. In this district private companies to date have been granted the right of exploration on 16,000 hectares.

Active work is being done to extend the production of oil in Argentina both on the part of the government and on the part of private enterprises. It is indicated that the government is favorable to extending private concessions although insisting at all times that these shall be guided officially, which is a condition not likely to attract foreign oil enterprises. In order to handle the production to better advantage the state is now doing development work in the port of Comodoro Rivadavia at a cost of $1,700,000 paper.

District Judge Names Receiver for General Oil Company

HOUSTON, TEXAS, Oct. 20.—Acting upon allegations of mismanagement, Judge J. D. Harvey, of the Eighteenth District Court at Hempstead, appointed H. McDonald of Houston, former justice of peace and more recently engaged in oil business, as receiver for the General Oil Company, a common law trust capitalized at $20,000,000, and the General Oil Company, a corporation capitalized at $1,000,000, of which S. E. J. Cox, now reported on his way to America from France, is president. Insolvency is not alleged but attorneys, on the contrary, state that both companies are solvent.

The appointment of a receiver was made upon an intervention filed by H. W. Hopkins in the suit of I. Leon against A. H. Kibby et al, which was pending in the Eightieth district court of Harris County, Texas. The bond of the receiver was fixed at $50,000 which he is now preparing to make. After making bond he will take charge of the companies and all persons formerly interested in them are enjoined from interfering with the receiver in the discharge of his duties. S. E. J. Cox, president; Mrs. N. E. Cox, H. A. Klees and A. H Kibby are named as defendants

Mr Cox gained much notoriety throughout the United States on account of the purchase of two airplanes which he entered in the Gordon-Bennett cup race in France. He is now on his way to the United States and Houston from France.

TO ESTABLISH FACTORY AT DALLAS

Dallas, Texas, Oct. 18.—It has been announced here that the Mack Manufacturing Company of Houston will erect a factory at Dallas for the manufacture of cable tools and other field equipment. The company is operating a plant at Houston. At a recent meeting of the stockholders of the company a 25 per cent stock dividend was declared and it was decided to increase the authorized capital to $2,000,000.

Stephens County Leads Texas In Amount of Daily Production

BRECKENRIDGE, TEXAS, Oct. 18.—For the week ending October 16, the average daily pipe line runs from producing wells in Stephens County exceeded the average daily runs of all fields in Wichita County for the first time since the golden days of the Burkburnett Boom and the development of the Northwest Extension and the proving of the K-M-A pool. With a total of more than 92,500 barrels average daily runs Stephens County attained the peak of its production to date, exceeding its own previous high record by almost 10,000 barrels.

Because of the high flush of a number of wells of the gusher type in Stephens County within the last three months the pipe line companies are up against it in the matter of transporting the oil that is and has been produced. Today virtually all of the available storage is utilized and the pipe lines are only handling production from the wells that are being completed, the oil in stock not being carried out of the county on account of the limitations of the pipe lines.

It is estimated that the average daily capacity of all pipe lines in West Texas, is between 84,000 and 86,000 barels. With last week's average daily production more than 90,000 barrels it is apparent that none of the oil in stock is being transported and that even the flush production from wells is being handled with exceeding great and ever increasing difficulty. For the storage problem in Stephens County today is a serious one and one that is commanding the attention of the larger companies in the State. Of course the smaller companies and the independent operators are interested since it is their oil that they wish the lines to handle.

The estimated storage in Eastland, Stephens and Comanche Counties is slightly in excess of 12,500,000 barrels. In June of this year when the average daily production in Stephens County was around 53,000 barrels there were approximately 8,724,000 barrels of crude oil in storage in West Texas. The additional available storage not utilized at that time was estimated at 4,000,000 barrels. Today all of available storage is utilized and the average daily production has increased almost 100 per cent while the pipe line capacity has not kept pace with the production.

Toady the Humble Pipe Line Company is handling the heaviest load of crude coming from wells in Stephens County. Deliveries to the Humble are being made by the Prairie, the Gulf and the Magnolia. These deliveries are made on carrier contracts solely. The Sun and Pierce also are making deliveries to the Humble line.

The Gulf Production Company is producing the greatest quantity of oil in Stephens County in point of individual company production. This company last week produced on an average of more than 11,000 barrels a day, based on pipe line runs. The previous week the Gulf produced more than 9,000 barrels and the week previous more than 8500 barrels. The Texas Company came second with more than 7700 barrels and the Magnolia Petroleum was third with more than 4200 barrels. The miscellaneous production was in excess of 50,000 barrels.

An idea as to how the flush production of wells recently completed in Stephens County may be gained by figures covering the number of wells completed since the last week in September up to the present time. During this three-week period there were two wells completed for 4000 barrels or more initial production. There were three wells completed in this period with a flush production each of 3000 or more barrels a day and two wells for an initial production each of 2000 or more barrels. There were six wells completed during this time for 1000 or more barrels flush production and more than 28 wells completed with initial production each of 500 or more barrels. And this is for a three-week period only.

Texas and Western Refiners Association to be Merged

TULSA, OKLA., Oct. 19.—Plans for combining the Texas Petroleum Refiners Associaton and the Western Petroleum Refiners Assocaton were tentatively agreed upon at a meeting of officials and directors of the two bodies in Oklahoma City Monday. A committee was appointed to work details of the merger. The association will be practically doubled in size by the merger, and will represent the independent refining interests for all the Mid-Continent, west and southwest territory.

One of the purposes of the meeting in Oklahoma City was to work out some plan for getting relief from the present excessive freight rates on refined products.

Clifford Thorne of the Western Petroleum Refiners Association said that the Independent refiners intend to fight it out "until just rates on petroleum products have been established."

Pat Malloy, president of the association opened the meeting and upon his suggestion Jules Germany of Dallas, president of the Texas Association, presided.

ZACAMIXTLE WELL MAKING 20,000 BARRELS

Tampico, Tamps., Oct. 21.—The Huasteca's well on lot 24 Zacamixtle, reported bridged in an earlier report to The OIL WEEKLY, has cleared out the bridge and after drilling a few feet deeper is reported good for at least 20,000 barrels. Some estimates run considerably higher. (Note—This supplements the report printed on Page 65.—Editor.)

Tampico, Tamps., Oct. 20.—The Mexican Sinclair Petroleum Corporation's No. 2, lot 251, Amatlan, has been completed for a 75,000 barrel well after considerable difficulty. It was completed around the 200 foot level. This well was near pay depth several weeks ago but due to some small obstacles arising the completion was defered. The well is in the center of production, north of Los Naranjos and the Tancochin River.

Tampico, Tamps., Oct. 20.—The Trans-Continental Petroleum Company's big well on lot 134, Chinampa, Southern fields, which blew off a 2000 pound gate valve and has been running wild at the rate of 60,000 to 70,000 barrels a day since the last of September has finally been capped. The pressure was so tremendous that another Dos Bocus blow out was feared and men in divers suits attempted to cap the well. The Dos Bocus blow out, which occurred several years ago, made a crater half a mile in width about the well.

ANOTHER ONE AT BLUE RIDGE

Houston, Texas, Oct. 21.—The Gulf Production Co.'s No. 1 Bassett Blakely at Blue Ridge came in flowing 3500 barrels at 2650 feet, according to late reports. The Gulf's C-3 Blakely, which came in last week, is now making about 800 barrels.

Washington, D. C., Oct. 19.—The state department has received a telegram from the American Consul General at London stating that the British Government has revoked the regulations prohibiting aliens from purchasing shares in mines and oil fields.

Three New Mexican Wells Have Total Production of 165,000 Barrels

TAMPICO, TAMPS., Oct. 20.—Three of the late completions in the Mexican oil fields had a total initial production of 165,000 barrels. Buckley-Wollett-Thompson interest's No. 2, lot 114, Chinampa, is a 60,000 barrel well at 1960 feet. This is the shallowest well of any of the five big producers on this one lot. The production of the late completion has been taken over by the Huasteca Petroleum Company. The Sinclair Company's No. 2, lot 251, Amatlan, making approximately 80,000 barrels is one of the biggest wells in that district producing from a shallow depth of 1884 feet. "El Aguila's" well on lot 240, Amatlan is the shallowest in the district, producing from 1840 feet. The Agwi Companies' No. 1 Federal Zone in the middle of the Tancochin River was completed at 1854 feet with initial production of 25,000 barrels.

Long Looked for Deep Sand at Goose Creek Found by Gulf

HOUSTON, TEXAS, Oct. 20.—A new, deep producing sand, long looked for at Goose Creek, has been found by the Gulf Production Company's No. 11 Churchill Gaillard "A," which was completed around 3914 feet Monday night, making 1000 barrels of pipe line oil by heads. Tuesday morning the well was made to flow steady but it later stopped through no apparent cause. Wednesday morning it was again flowing 1000 barrels by heads and, although this well is not considered properly completed, it has all the car marks of a big producer with gas pressure registering 700 pounds to the square inch. The oil produced is 28 gravity. Oil men have contended for some time that oil would be found in a deep strata at Goose Creek as no salt was ever found.

The Gulf's well is the deepest in the proven teritory although the E. F. Simms & Company's No. 33 Ashbel Smith was completed for a gasser several weeks ago below 4000 feet. This well is about one mile and half east of the Gulf's well and about three quarters of a mile east of the old pool. It is still gasing and now making about 150 barrels of good oil. Because of the distance between the two wells it is considered very improbable that they are producing from the same sand. The Gulf's well is nearly 500 feet deeper than any well previously completed in the proven territory It was completed with two joints of screen or in about 40 feet of pay. No estimate as to the depth of the strata can be made. It was drilled with a steel derrick, the only one ever used in the Gulf Coast.

Equal Oil Privileges by World Agreement, Urged by Speaker

TULSA, OKLA., Oct. 20.—An international agreement by all nations having oil interests to guarantee equal privileges to nationals of all countries in the development of oil fields in all parts of the world, was urged by Van H. Manning of the Petroleum Institute and formerly of the Bureau of Mines, in an address before the Mid-Continent Oil and Gas Association here last night.

Manning pointed out that the world will have to depend upon the undeveloped nations of the East for its future supply of crude oil. India, the Asiatic countries, Mesopotamia, Russia, and other Eastern territories hold the future supply of crude petroleum, he said. Oil companies of the United States control only 18 per cent of the estimated crude oil deposits of the world. Of the 21 nations having oil deposits or oil developing companies among their nationals, 17 have strict laws discriminating in favor of their own interests in the development of these resources. Although the United States is at present the greatest producer of oil in the world, there is no limitation or restriction against nationals of other counries developing oil fields in the United States.

Dr. Manning believes that an international agreement could be worked out that would guarantee free and equal participation by the nationals of all countries in exploring for oil. Such an agreement would not only facilitate development of fields now lying dormant but would prevent international complications that might lead to serious results. The world needs more oil than is being produced now, and Dr. Manning believes that such an agreement as suggested would make it possible for aggressive companies to explore for oil in all parts of the world and greatly increase the production of petroleum products.

Harry Smith of the Mid-Continent Oil and Gas Association made his annual report to the meeting of the association, showing in detail the achievements and efforts of that organization during the past year.

Executive committeemen for the Kansas and Oklahoma division of the association were elected as follows:

Tulsa Members—Frank Haskell, James K. Crawford, Frank Breene, R. A. Griffith, Dana H. Kelsey, Henry McGraw, P. M. Malloy, H. H. Goodard, J. W. Sloan, W. L. Kistler, R. C. Sharp, W. G. Skelly, P. G. Walker, Jr., C. T. Wilson, J. F. Darby, George E. Black, H. N. Cole, D. F. Connelly, A. W. Leonard, John A. Markham, Jr., E. R. Perry, James A. Veasey, J. W. Bates, L. E. Z. Aronson, H. G. Barnard, J. J. Shea, Pat Hurley, Waite Phillips, Charles F. Farren, J. R. Hadley, J. A. Hull, Burt Collins, R. A. Brumfield, W. E. Templeman, Charles F. Noble and H. F. Wilcox.

Oklahoma City Members—J. R. Cottingham and B. B. Blakeny.

Bartlesville Members—J. H. Brennan, J. H. Straight, Wm. Davis, Johns Kane and Burdette Blue.

Okmulgee Members—John H. Rebold and E. E. Schock.

Ardmore Members—P. C. Dinks and Wirt Franklin.

Ponca City Members—J. J. McGraw and E. W. Marland.

Other Oklahoma Members—L. N. Fink, Muskogee; H. H. Champlin, Enid; E. B. Lawson, Nowata; C. B. Peters, Pawhuska; W. D. Austin, Chickasha.

Kansas Members—A. M. Landon, Independence; Charles Owens, Caney; L. Marcel, Fred Stanley and A. L. Derby, all of Wichita.

REFINED AND CRUDE MARKET BAROMETER

Further Recession Is Noted in Lower Grades of Gasoline

TULSA, OKLA., Oct. 19.—Lower grades of gasoline yielded to further weakening in the market during the past week, though the better quality product held to quotations of the previous week, in the Mid-Continent teritory. Gas oil, kerosene and fuel oil are still showing sluggishness, with the refiners expecting that these commodities will strengthen within a fortnight.

Shipments from Tulsa during September, as recorded by the various railroads, showed a marked decline over the records for August. During the last month prior to the advance in freight rates, about 10,000 cars of refined stuff was shipped out of Tulsa, and in September only 6791 cars moved out.

These comparative figures will be watched closely by refiners and carriers alike, as it is maintained by the former interests that the roads will not realize as much revenue under the new system of rates as they did under the old schedules, due to a decline in the business they will handle. If experiences justifies this contention, the refiners will be armed with proof that is calculated to insure them a favorable hearing on a revision downward of the present freight rates.

Nothing new developed in the market situation during the past week. The normal rate of decline, established during the past month, was maintained, with the exception of the grades of gasoline above new Navy specifications.

Range of prices in group 3 territory this week on the basic line of refined products, spot sales, car lot, f. o. b. group 3, are as follows:

Gasoline, S R, 56-58, 450 end	20	20½
Gasoline, S R, 58-60, 437 end	21	21¼
Gasoline, S R, 60-62, 400 end	22½	23
Gasoline, S R, 64-66, 365 end	24	
Raw casinghead, 80-84	21½	22
Casinghead blend, 58-60	19½	
Casinghead blend, 60-62	20¼	20½
Gas oil	6 3-7	7
Kerosene, W W, 42-43	9	9¼

TEXAS OIL JOBBERS FORM AN ASSOCIATION AT DALLAS

Dallas, Texas, Oct. 20.—Organization of the Texas Oil Jobbers Association was perfected here Friday. The Association was formed last month in Fort Worth.

Members of the association are dealers in refined products. Producing and refining concerns are to be admitted to associate memberships.

The object of the organization is to promote trade courtesies among members and to maintain credit ratings of Texas dealers. The meeting here Friday adopted the code of ethics as issued by the Federal Trade Commission and later adopted by the American Petroleum Association.

D. E. Little of Fort Worth is president; L. C. Harper of Fort Worth, secretary and P. R. Plummer of Fort Worth vice president.

AVERAGE DAILY PRODUCTION MID-CONTINENT

	Last Week
Central West Texas	140,345
North Texas	82,450
Texas Coastal	108,435
Total Texas	331,230
Kansas	91,400
Oklahoma	296,900
Total Kansas-Oklahoma	388,300
North Louisiana	87,300
South Louisiana	6,900
Total Louisiana	94,200
Total Mid-Continent	813,730

ORDERS SALE OF PROPERTY

Dallas, Texas, Oct. 20.—Sale of the properties of the Home Oil & Refining Company, now in receivership, has been ordered by Judge Roy of the Seventeenth District Court at Fort Worth. The court order specifies that physical properties of the concern shall not be sold for a total amount of less than $1,500,000. A 5000 barrel refinery at Fort Worth is part of the property. The sale is to be held in the court room, November 29.

NO TANK WAGON CHANGE

Dallas, Texas, Oct. 20.—Service station and tank wagon prices on kerosene and gasoline in the Southwestern territory remained steady during the past week, with no changes reported. The drop of two cents in the price of kerosene at San Antonio, reported last week exclusively in The OIL WEEKLY has not been met by any of the other cities in Texas.

The following are the prevailing prices in this district:

	Kerosene	Gasoline	
Texas Points:	T.W.	T.W.	S.Sta.
Dallas	20	28	30
Fort Worth	20	28	30
San Antonio	18	28	30
Amarillo	21	29	31
Houston	20	28	30
Oklahoma Points:			
Oklahoma City	19	28	30
Tulsa	20	28	30
Woodward	21	30	32
Muskogee	21	29	31
Arkansas Points:			
Little Rock	22	29	32
Pine Bluff	22	29	32
Fort Smith	21	28	31

B. G. Dawes and family have returned to the States after an extended visit in Europe. Mr. Dawes is president of the Pure Oil Company.

Kerosene Halts Its Downward Tendency

Fort Worth, Texas, Oct. 20.—Kerosene has halted in its downward tendency and is steadying now, with a perceptible increase in demand from both foreign and domestic quarters. For export movement kerosene is being contracted in Oklahoma by North Texas jobbers at 9 cents, and for movement to Southeastern states, particularly to the Carolinas, Georgia, Alabama, and Florida, the prices range from 9¼ to 9 cents.

Gasoline is presenting a doleful future just at this time, but the tank wagon and retail price remains unchanged, despite talk to the contrary. While there is little or no stability in the gasoline market, it is being contracted for at 19½ to 19 cents for immediate turnover. Even transactions in this commodity covering ten day delivery period are scowled at by jobbers. It still is "pay what you are forced to and sell at once, even though the profit be meager."

Fuel oil and gas oil remained virtually unchanged, with the future presenting a more promising situation for fuel oil than for its running mate, gas oil. The ginning season is well under way, but ginners in North Texas are not running around paging marketers for quotations. It's not done that way now. Prices on fuel oil range from 20 cents to 25 cents lower all the way round, as compared to prices quoted by some jobbers last week.

May Change Specifications of Gasoline, Kerosene and Lubes

Washington, D. C., Oct. 21.—Changes in the government specifications on gasoline, kerosene, fuel and lubricating oils were discussed at the interior department this week by the technical sub-committee of the committee appointed by the president to standardize petroleum specifications.

The meeting was opened on Monday, when members of the committee and representatives of the various branches of the petroleum industry gathered to discuss the need for changes in the specifications and the possibility of perfecting specifications which could be adopted by the various states. A number of changes were recommended, practically all of which were of a minor nature. On Tuesday and Wednesday the sub-committee held executive sessions for the purpose of discussing the proceedings of Monday and deciding upon the adoption of the various recommendations. The report of the sub-committee will be made this week to the full committee. What changes will be recommended was not divulged by those who attended the executive sessions.

The possibility of providing gasoline specifications that could be adopted by the entire country came in for considerable discussion on Monday. At present only four states—Florida, Nebraska and North and South Carolina—have uniform laws, these states having adopted the specifications now in force in the government. Some of the other states have no laws at all concerning the subject, while others have laws which do not conform with the government specifications or with the laws of other states.

Refined "Hand to Mouth" Buying Continues in Chicago District

By Special Correspondent

CHICAGO, Oct. 18.—Inquiries continue reluctant on the Chicago refined products market. With prices slowly but steadily weakening ever since August, buyers are apparently making every effort to "keep up the good work," despite their depleted storages. Some, furthermore, are no doubt of the opinion that what is happening in the automobile industry may happen in the oil, though in a less marked degree—and that oil prices will not recover from the present slump.

Chicago refiners claim that buyers who are of this belief are due for an early disillusionment. They argue that oil prices were never inflated as were automobile prices, and that a policy of "hand to mouth" buying on the part of jobbers and consumers, either through overcaution or an effort to beat down prices, is essentially unhealthy and will prove a boomerang. They believe that when the buyers are forced back into the market, due to the complete exhaustion of their supplies, prices will react upward sharply, and that this return of activity, furthermore, is due to come at a period usually marked by transportation difficulties, namely early winter.

In the meantime, the refineries are quoting slightly lower prices on some items than a week ago, in order to encourage the tardy movement of products. Gasoline prices on both Eastern and Mid-Continent products have weakened a trifle. Mid-Continent neutral oils can also be bought somewhat lower, though Pennsylvania neutrals have held firm. Practically all cylinder stocks have been firm.

The fuel oil market is somewhat puzzling. Small refiners are in instances quoting exceedingly low prices. Offers of small quantities are alleged to have been received here as low as $2.30. One marketer states, however, that he tried to secure some fuel oil at $2.45 from a small refiner who quoted that price in a form letter, and was told in reply that the supply was sold out. He states he has been unable to buy fuel oil at $2.45.

Refiners view with regret the coal strike in England, believing that unless it is settled early it will draw into export channels a million tons of coal a month which normally would find domestic consumption. While such a situation would undoubtedly increase the price of fuel oil, it is believed it would have a detrimental effect generally on industry in the United States, this winter.

There is little excuse for the continued decline of fuel oil prices. One New York firm is reported as having contracts for 600 fuel oil installations in New York and 400 in Boston. It is also stated that the Nokol people are installing thousands of Nokol burners, which consume gas oil, in private homes. One factor contributing to the present situation is probably this: That fuel oil prices were high and firm last summer, despite the fact that summer is usually the dull season for this product. This led consumers to buy, in the belief that prices would go sky high later on, with the result that some of the demand which would normally be felt now has already been supplied.

The Chicago market for vegetable and animal oils and naval stores continues inactive. This, too, is defined as a "hand to mouth" buying situation, and its is predicted that transportation difficulties will face the buyers if they pursue their present actics much longer.

BUYER'S MARKET IN NORTH TEXAS

Wichita Falls, Texas, Oct. 20.—The market in North Texas still remains one to the buyer's liking. Gasoline is weaker, if any change has come about on that commodity. Fuel oil has pulled away from the low mark of $2.35 of two weeks ago. All products, however, are weak.

Buyers are taking advantage of the weaker refiners. Concerns which depend on the monthly turnover of their stocks to keep their stills hot, are the prey of buyers with cash. Such refiners are forced to sell at whatever figure is offered. In not a few instances, such refiners have gone out with inquiries asking for the "best price" on products.

Some gasoline has sold as low as 18 cents. But the majority is now selling above 19 cents.

Refiners are hopeful that the approach of cooler weather will further stimulate the fuel oil market. There is not much worry about fuel oil, at least there is not much among refiners equipped with storage and finances to hold it. For the general feeling is that fuel oil will again reach the $3 mark, once cold weather grips the Northern states.

REFINERY MARKETS

GASOLINE AND NAPHTHAS

(Prices October 18.)

Pennsylvania

	Per gallon
54 Naphtha	23½
56 Naphtha	24
58 Naphtha	24½
60 Straight-run Gasoline	24¾
62 Straight-run gasoline	25½
64 Straight-run Gasoline	26½ 27
68 Straight-run Gasoline	27¾
58-60 Blend, 460 end point	23
60-62 Blend, 450 end point	23
62-64 Blend, 450 end point	23
66-68 Blend, 440 end point	23
60-70 Blend, 440 end point	23
68-70 Blend, 420 end point	23

Chicago

(Current quotations on Chicago market f. o. b. refinery.)

50-52, 450 end point	20	21
56-58, 450 end point	20½	
58-60, 430-440 end point	21	21½
60-62, 400 end point	23	23¾
62-64, 375 end point	25	25½
64-66, 365 end point	25	25½
58-60, 140 i. b. p., 428 e. p.	21	21½
80-84 Raw Casinghead	21	
68-70 Blend, 430-435 end point	20½	21½
66-68 Blend, 450 end point	20½	21½
60-62 Blend, 450 end point	20½	21½
58-60 Blend, 440-450 end point	20½	21½
74-76 Absorption Gasoline	21	22

FUEL OIL

(Prices October 4.)

Pennsylvania

36-40 Fuel Oil	10½

Chicago

(Current quotations on Chicago market f. o. b. refinery.)

32-36 Gas Oil (gal.)	6¾	7¼
24-26 Fuel Oil (bbl.)	$2.40	$2.50
Fuel Oil, buyer's cars (bbl.)	2.20	2.30

NEUTRAL OILS

Pennsylvania

200 Vis. No. 3 Assoc. Filt.	31	
180 Vis. No. 3 Assoc. Filt.	29	30
150 Vis. No. 3 Assoc. Filt.	25½	

Chicago

(Current quotations on Chicago market f. o. b. refinery.)
(Viscosity test 70.)

100 Vis. No. 2 Color	12½	13½
200 Vis. No. 3 Color	24¼	25
160 Vis. No. 4 Color	21	22
200 Vis. No. 4 Color	23½	24
200 Vis. No. 5 Color	23	23½

CYLINDER STOCKS

Pennsylvania

600 Steam Refined	34
650 Steam Refined	49
635 Steam Refined	45
600 Flash	61
600 Amber Filtered	55
600 Medium Filtered (D)	70
Cold Test Stocks (bright filt.)	85
Cold Test Stocks (dark filt.)	82

Chicago

(Current quotations on Chicago market f. o. b. refinery.)

600 Steam Refined (bright green)	20	22
600 Steam Refined (dark green)		16

BURNING OILS

Pennsylvania

45 Water White	14
46 Water White	14½
47 Water White	15
300 Burning Oil	15¼

Chicago

(Current quotations on Chicago market f. o. b. refinery.)

42-43	9	9½
44-46	14½	15½
42-43 Distillate	8½	9

WAX

Pennsylvania

122-124 White Crude Scale Wax, N. Y., lb.	8	8½
124-126 White Crude Scale Wax, N. Y., lb.	8¼	8½

Chicago

(F. O. B. Refinery, group 3.)

122-124 White Crude Scale Wax	7½	7¾
124-126 White Crude Scale Wax	7¾	8

REFINERS' AND JOBBERS SUPPLIES

Prevailing market quotations f. o. b. manufacturing points, October 11.

Chemicals

Soda Ash, light, single bags, cwt.	$2.50
Silicate of Soda 60 deg., cwt	2.90
Sal Coda, cwt	2.00
Caustic Soda, solid—Works, cwt.	4.00
Sulphuric Acid, tank cars, f. o. b. seller's shipping point, ton	$22.00
Benzol, pure—tank cars, gal.	0.35
Benzol, 90 per cent—tank cars, gal.	0.33
Toluol, gal.	0.35
Chloride of Lime, lb.	08¼ .08½

Animal and Vegetable Oils

English Degras, lb.	$0.06¼
Domestic Degras, lb.	0.08
Horse Oil, lb.	0.14
Lard Oil—	
Winter Strained, gal.	1.35
Extra No. 1, gal.	1.20
No. 1, gal.	1.15
No. 2 lard, gal.	1.00
Neatsfoot Oil—	
Winter Strained, gal.	1.65
Prime, gal.	1.45
No. 1, gal.	1.30
Menhaden Fish Oil—	
Light Pressed, gal.	0.90
Winter Bleached, gal.	0.95
Sperm Oil, gal.	2.00
Whale Oil—Extra Winter Bleached, gal.	1.20
Soya Bean Oil, lb.	0.14
Linseed Oil—	
October, gal.	1.20
November and December, gal.	1.10
Herring Oil, gal.	0.90
Seal Oil, gal.	1.40

Naval Stores

Rosins, all grades, Chicago	$13.05
*Rosins, B to I	11.55
*Rosins, K to W	11.55
Turpentine, barrels, Chicago, gal.	1.36
*Turpentine	1.23
Rosin Oil, first run, gal.	0.76
Rosin Oil, second run, gal.	0.79
Pine Tar, Kiln Burnt Oil, bbls.	15.50
Pine Tar, Retort Oil, bbls.	16.00
Navy Pitch, No. 1, bbls.	7.50

*Savannah, Ga., market.

Old Ranger Field Extended Three Miles West to Eastland

FORT WORTH, TEXAS, Oct. 20.—The old Ranger field has been extended some three miles to the west of the town of Eastland by the completion last week of the Star State Oil Company's No. 1 R. L. Rust, between Eastland and Cisco. This well came in for 100 barrels, and later increased and is producing from the shallow stratum, the total depth being 1585 feet. The well created considerable excitement when it was completed, as it is located directly on the route of the Bankhead Highway through Eastland County, and travelers through that section paused in their journey to look on. The nearest production is three miles to the east. The Rust well is flowing, and came in without agitation.

Another recent completion in the Ranger district is the Sun Company's No. 3 S. K. Shuler, which has been shot and is making 200 barrels at 2810 feet. This well was completed July 21, 1920, for 1000 barrels at 2664 feet. The Penn-Tex Oil Company's No. 1 Gooch is estimated at 60 barrels at 2470-77 feet. However, the drillers at this well are setting casing and will swab. There is a small showing of gas. There are a number of wells nearing completion which have a good showing of oil and which should be brought in within the next ten days, barring unforeseen delays and inclement weather.

In the Leeray and Gunsite districts to the north, activity continues with renewed effort being put forth around the Higginbotham tract, where the No. 1 well of the Higginbotham Drilling Company was completed recently for 325 barrels. This company also has two other wells drilling on their lease, the No. 3 well below the 2500 foot level and the No. 4 well below the 2000 foot depth. The No. 1 well is about two miles south of the Eastland-Stephens County line.

Daily production in the Ranger section, based on pipe line runs of the larger companies operating there, slumped some 700 barrels last week as compared to average daily pipe line runs for the week previous, last week's total being approximately 15,630 barrels. While this slump was being felt there was a slight increase in production of the miscellaneous companies in the Ranger district last week. Independents and the smaller corporations last week averaged 8430 barrels a day, and for the seven-day period prior to that the daily average was 8165 barrels. Virtually all of the larger companies—notably the Gulf Production, Magnolia and Humble, about held their own in daily pipe line runs.

EASTLAND COUNTY PRODUCTION

The daily average production of Eastland County during the past week was approximately as follows:

	Barrels
Prairie Oil & Gas Company	1,150
Texas & Pacific Coal & Oil Company	1,625
The Texas Company	750
Sinclair Consolidated	1,675
Gulf Production Company	800
Magnolia Petroleum Company	490
Humble Oil & Refining Company	1,475
The Sun Company	115
Mid-Kansas Oil & Gas Company	120
Miscellaneous	8,430
Total	16,630
Last week	16,320

STRAWN PRODUCTION

	Barrels
Texas & Pacific Coal & Oil Company	1050
Miscellaneous	700
Total	1750

RANGER COMPLETIONS

Caldwell Oil Co.'s No. 1 Green, swabbing 20 bbls, 3340 ft.

Jack Crosbie's No. 9 Crosbie, 10 bbls on pump, 1356 ft.

Indiahoma Oil Co.'s No. 3 Sneed, swabbing 50 bbls after shot, 3250 ft.

Magnolia Petroleum Co.'s No. 2 M. Loper, 15 bbls after shot, 3357 ft.

Penn Tex Oil Co.'s No. 1 J. N. Gooch, est. 60 bbls, 2527 ft.

Riddle et al's No. 1 F. O. Stokes, abn 1620 ft.

Sinclair Gulf Oil Co's No. 6 Danley, 10 bbls on pump after shot, 3494 ft.

Star State Oil Co.'s No. 1 R. L. Rust, 60 bbls. est., 1585 ft.

Virginia Oil Co.'s No. 1 G. W. Thorp, 10 bbls on pump after second shot, 3165 ft.

Sun Co.'s No. 3 S. K. Shuler, 200 bbls after shot, 2810 ft.

Prairie Oil & Gas Co.'s Nos. A-4 Madding, abn 3499 ft; A-3 Christmas, swabbing 12 bbls after shot, 3467 ft.

Texas & Pacific Coal & Oil Co.'s No. 24 Butler, 10 bbls on pump after shot, 3525 ft.

RANGER WELLS NEARING COMPLETION

American Oil Eng. Corp.'s No. 1 F. O. Stokes, preparing to abn, 3251 ft. Arkansas Nat. Gas Co.'s No. 3 Tully Connellee, co after second shot, 3201 ft.

Choate Oil Co.'s No. 3 Mattie Baggett, co after second shot, 3197 ft.

Delmar Oil Co.'s No. 1 I. T. Hitt, co after shot.

Empire Gas & Fuel Co.'s No. 1 St. John, plugging back to pay 3070 ft.

H. V. Foster's No. 1 K. Hilburn, 100 bbls est. and co after shot 3200 ft.

Greenwood & Terrell's No. 1 Baggett, 2000 ft oil in hole after shot, 3230 ft.

Gulf Production Co.'s Nos. 1 Mattie Baggett, one 20 bbl flow and now 2500 ft oil in hole after shot, 3239 ft; 1 Thorp, 45 bbls and fsh for bailer 3450 ft.

Hughes Petroleum Co.'s No. 1 Watson, topped lime and dr 3315 ft. Humble Oil & Ref. Co.'s No. 1 Ingram, co to shoot again, 3285 ft.

C. L. Mullen's No. 1 Schmick, co after shot 3540 ft.

A. G. Parker's No. 3 W. H. Green, 1500 ft oil in hole and co off bottom 3254 ft.

Root-Hup-Duff Oil Co.'s No. 1 Goode, 500 ft oil in hole and co after shot 3270 ft.

Smith & Burns' No. 1 F. Goode, topped lime and dr 3179 ft.

States Oil Corp.'s Nos. 3 Nix, co after shot 3316 ft; 4 Nix, co after shot 3273 ft; 1 J. W. Ray, co after shot 3656 ft; 2 W. H. Ray, co after shot 3318 ft; 5 T. J. Shannon, co after shot 3334 ft.

The Texas Co.'s No. 1 Maxwell, topped lime 2463 ft and dr 2470 ft.

Universal Oil Co.'s No. 1 Nerger, no production after shot, 3090 ft.

Sun Co.'s No. 6 Shuler, 2,000,000 cu ft gas and dr, 2792 ft.

H. D. ELVIDGE,
New assistant advertising manager of the Reading Iron Company

RANGER WELLS BELOW 3000 FEET

Choate Oil Co.'s No. 1 Mattie Baggett, co 3320 ft.

Eldorado Oil & Gas Co.'s No. 1 Williamson, setting casing 3465 ft.

North American Ref. Co.'s No. 1 Connellee, sd 3802 ft.

Plateau Oil Co.'s No. 1 Thorp, dr 3115 ft.

Sapulpa Oil & Ref. Co.'s No. 1 Pippen, dr 3677 ft. States Oil Corp.'s Nos. 3 Dooley, fsh 3259 ft; 1 Fisher, dr 3162 ft; 1 Gilbreath, dr 3712 ft; 1 Hammett, dr 3564 ft; 2 Henderson, sd 3358 ft.

Texas & Pacific Coal & Oil Co.'s Nos. 32 Norwood, sd 3360 ft; 4 Terrell, dr 3376 ft; 6 Terrell, sd 3580 ft. Transcontinental Oil Co.'s No. 2 Thorp, dr 3292 ft.

OTHER RANGER OPERATIONS

Ardizzone-Braden Oil Co.'s No. 1 Stennett, dr 3998 ft. Fred Coogan et al's No. 1 Mattie Baggett, dr 1987 ft.

Delmar Oil Co.'s No. 2 Hitt, dr 1540 ft. Drillers Oil Co.'s No. 6 Barnes, co 1750 ft.

Empire Gas & Fuel Co.'s No. 2 St. John, dr 1880 ft.

H. V. Foster et al's Nos. 3 W. C. Hilburn, dr 1495 ft; 2 Smoot, dr 752 ft.

Gabriel Brannan's No. 1 Reagan, dr 1425 ft. Gulf Production Co.'s No. 3 Ray, dr 684 ft.

Humble Oil & Refining Co.'s Nos. 1 Martin, dr 2281 ft; 1 Ray, dr 558 ft; 1 Thorp, dr 956 ft; 1 Wharton, ur 2900 ft.

Invincible Oil Co.'s No. 5 Shook, dr 857 ft.

Jackson Oil & Ref. Co.'s No. 1 Daniels, ur 1050 ft.

Latshaw et al's No. 1 Jackson, sd 845 ft. Lone Star Gas Co.'s No. 1 Goode, dr 2992 ft.

Magnolia Petroleum Co.'s Nos. 1 Collier, dr 574 ft; 1 Moore, dr 1601 ft. Manley-Heck Oil Co.'s No. 1 Brook, ur 2815 ft. Mid-Kansas Oil & Gas Co.'s No. 8 Harrell (Acct. 2), dr 2146 ft. Mitchell Producing Co.'s No. 1 Davis, dr 2790 ft.

North Texas Oil Co.'s No. 1 Goode, dr 2210 ft.

Okeh Ranger Oil Co.'s No. 1 Caudle, dr 2062 ft.

A. G. Parker et al's Nos. 2 Green, dr 2415 ft; 5 Green, dr 2410 ft. Prairie Oil & Gas Co.'s No. 1 Stewart, dr 325 ft.

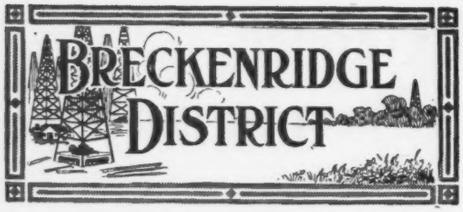
Ranger-Brooks Oil Co.'s No. 1 Thorp, ur 1140 ft. Rising Star Production Co.'s No. 1 Cox, sd 2925 ft. Royal Duke Oil Co.'s No. 1 Gardner, sd 580 ft.

Sheffler et al's No. 1 Green, dr 1220 ft. States Oil Corp.'s Nos. 7 Parrock, dr 2448 ft; Shamberger, fsh 865 ft; 2 Shahan, co 2002 ft.

Texas & Pacific Coal & Oil Co.'s No. B-4 Butler, setting casing 702 ft.

Virginia Oil Co.'s No. 2 Thorp, sd 2050 ft.

White Oil Corp.'s Nos. 1 Thorp, sd 2610 ft; 2 Thorp, sd 1310 ft.



Bass Well in Stephens County Making 13,000 Barrels After Shot

DALLAS, TEXAS, Oct. 20.—Bass Petroleum Company's No. 1 W. C. Goodwin, which was completed June 29, this year, by the Walker & Perkins interests for 5000 barrels, was drilled about four feet deeper and after a shot started flowing at the rate of 13,000 barrels a day. This well is located on a 40 acre tract that was sold to the Bass Petroleum Company for $1,000,000, of which $150,000 was in cash and the balance to be paid in oil. The well originally was completed at 3170 feet.

Average daily production from all wells in Stephens County last week spurted some 20,000 barrels over the week previous, bringing the average daily production to more than 110,000 barrels, based on pipe line runs. This total is a new high mark for Central West Texas and bids fair to surpass the production of North Texas in the balmy days of Burkburnett and the Northwest Extension. However, this enormous jump in pipe line runs complicates all the more the storage problem that has assumed serious proportions in Stephens County. A policy of curtailing the completion of wells for a period of 15 or 20 days already is under consideration by the larger operators in Stephens County.

The big gain in daily production in Stephens County last week was in the pipe line runs of the miscellaneous companies, those not included among the big corporations operating in that section. It is noteworthy that the small company and the independent operator is reaping much benefit in Stephens County where he has an equal chance with the rest to recover oil in commercial quantities. This accounts for the fact that many of the smaller companies in the Stephens County fields are on a paying basis today and are in no way cramped for funds. This condition never fostered a panic.

Perhaps the most noteworthy completion of the week is the bringing in by the Montrose Oil Company of their No. 1 well on the S. J. Allen tract, 10 miles northeast of Breckenridge and adjoining the Phillips lease of the Shawmut Petroleum Company to the west. The Allen well was shot last Monday with 80 quarts and began flowing at the rate of 2200 barels a day. Later in the week officials of the Montrose announced the well as making better than 3000 barrels. The charge was placed from 3316 feet to 3346 feet and production is from a black lime and coarse sandy formation. The Phillips well, which is to the west, came in some time ago at 100 barrels and later increased to 300 barrels. It now is making better than 200 barrels a day. This section has been coming in for important play the last month and the completion of the Allen well at this time is booming the North half as never before. It is interesting to recall that Cooper & Henderson drilled a dry hole about a mile due south of the Allen well. The dry well was carried to a depth around 3475 feet.

Another good completion in the North half of Stephens County this week was the Carteret Oil Co.'s No. 2 Walker for 200 barels at 3150 feet. This well is in the Breckenridge townsite and is an offset to the west of the Gulf Production Company's I. A. Stoker tract.

STEPHENS COUNTY PRODUCTION

The average daily production of Stephens County during the past week was approximately as follows:

	Barrels
Gulf Production Company	11,500
The Texas Company	7,575
Magnolia Petroleum Company	3,650
Mid-Kansas Oil Company	3,200
T. & P. Coal & Oil Company	2,730
The Sun Company	1,920
Humble Oil & Refining Company	3,350
Prairie Oil & Gas Company	2,790
Sinclair Consolidated	1,925
Miscellaneous	71,440
Total	110,080
Last week	92,450

STEPHENS COUNTY COMPLETIONS

Ajax Oil Co.'s No. 3 Good, 50 bbls after shot, 3277 ft.

Atlantic Oil Producing Co.'s No. 1 Brazell, abn, 3722 ft.

Big Seven Oil Co.'s No. 2 Bratton, abn, 3725 ft.

H. C. Chapman et al's No. 4 Johnson, 700 bbls, 3261 ft.

Gulf Production Co.'s Nos. 10-B J. M. Ward, 332 bbls, 3110 ft; 1 J. M. Rush, abn, 3575 ft.

Galvez Oil Co.'s No. 3 Ward, 250 bbls, 3130 ft.

Humble Oil & Refining Co.'s Nos. 2 Guffey, 250 bbls after shot, 3098 ft; 3 Smith, 40 bbls after shot, 1794 ft.

Magnolia Pet. Co.'s No. 6 Brown, 200 bbls after shot, 3006 ft.

Mid-Kansas Oil & Gas Co.'s No. 1 Tullos (AC2), 300 bbls after shot, 3235 ft.

Lone Star Gas Co.'s No. 14 Warren, 200 bbls, 1862 ft.

Moorman & Gholson's No. 2 Hand, abn, 3299 ft.

Prairie Oil & Gas Co.'s No. 3 Guest, abn, 3460 ft.

Snowden & McSweeney's No. 1 Ashburner, 350 bbls, 3216 ft.

Sun Co.'s No. 6 Stoker, 150 bbls, 3131 ft.

T. & P. Coal & Oil Co.'s No. 2 Veale, abn, 3665 ft.

Galvez Oil Co.'s No. 3 Dickey, 1500 bbls, 3133 ft.

Humble Oil & Ref. Co.'s No. 1 A. Dickey, 2200 bbls oil and some water, 3167 ft.

Magnolia Pet. Co.'s No. 1 A. Nemir, 120 bbls after shot, 3144-3189 ft.

Prairie Oil & Gas Co.'s No. 4 Atkins, pumping 15 bbls oil and some water after shot 3193-3245 ft.

Snowden & McSweeney's No. 2 Dr. Ball, 410 bbls after shot, 3108-3143 ft.

STEPHENS COUNTY WELLS NEARING COMPLETION

Considine, Hale & Knight's No. 2 M. F. Martin, preparing to shoot, 3206 ft.

Cosbrook Pet. Co.'s No. 2 W. H. Ackers, 500 ft oil in hole, sd for shot 3219 ft

Finell Oil Co.'s No. 1 J. W. Crowley, trying to shut off gas, 3141 ft

Quakins Petroleum Co.'s No. 1 B. S. Walker, 650 bbls, dr 3130 ft.

Henry Riley et al's Nos. 1 A. J. (AC2), 200 bbls, fsh tools 3250 ft; 3 A. J. Johnson (AC1), showing gas, running casing 3232 ft.

Snowden & McSweeney's Nos. 1 Dr. Ball, 40 bbls, 3115 ft; 8 Higinbotham, 40 bbls, dr 3138 ft.

Walker & Perkins' No. 8 W. C. Goodwyn, 300 bbls, re-setting casing 3151 ft.

Breckenridge Producing Co.'s No. 1 Burnsides, 400 bbls, sd for shot 3165 ft.

Brown Oil Co.'s No. 2 Dickey, 200 bbls, dr 3158 ft.

Cosbrook Pet. Co.'s No. 3 Ackers, swabbing oil and water, sd 3262 ft.

Fensland Oil Co.'s No. B-1 Walker & Caldwell, swabbing some oil, 3120 ft.

General Producing Co.'s No. 1 Funk et al, 500 bbls, dr 3169 ft.

Haile & Knight's No. 1 Walker & Caldwell, 600 bbls, sd 3207 ft.

Humble Oil & Refining Co.'s No. 1 Alexander, made one flow after shot, sd 3275 ft.

Lauderdale et al's No. 4 Hale, 300 bbls, dr 3109 ft.

Quakins Pet. Co.'s No. 1 Walker & Caldwell, 150 bbls, dr 3110 ft.

Sinclair Oil & Gas Co.'s Nos. 3 Smith, 400 bbls, dr 3114 ft; 4 Smith, 250 bbls, dr 3120 ft.

Snowden & McSweeney's No. 2 Ball, 200 bbls, preparing to shoot, 3142 ft.

The Texas Co.'s Nos. 2 Kennedy, 250 bbls oil and 6,000,000 ft gas, fsh 3113 ft; 1 Grimes, co 3212 ft; 5 Pierce, sd for shot, 3266 ft; 4 Day, 40 bbls, dr 3075 ft.

T. & P. Coal & Oil Co.'s No. 3 Veale, co 3645 ft.

MISCELLANEOUS PRODUCTION

The daily average production of the miscellaneous fields in Central West Texas not carried on other pages follows:

	Barrels
Moran	140
Brown County	300
Coleman County	290
Thrall	300
Corsicana light	275
Corsicana heavy	468
Total	1773

STEPHENS COUNTY WELLS BELOW 3000 FEET

Brooks-Strong Oil Co.'s Nos. 1 Walker & Caldwell, dr 3110 ft; 3 Dickey, sd 3070 ft.

Cooper & Henderson's No. 2 Sloan, dr 3028 ft. Cosbrook Petroleum Co.'s No. 3 Ackers, sd 3262 ft.

Gulf Production Co.'s No. C-8 Ward, dr 3140 ft.

C. S. Hart et al's No. 1 Walker & Caldwell, sd 3001 ft. E. P. Harwell et al's No. 1 Owens, fsh 3247 ft. Humble Oil & Refining Co.'s No. 1 Pugh, dr 3085 ft.

Link Oil Corp.'s No. 1 Black Bros., dr 3070 ft.

Prairie Oil & Gas Co.'s No. 3 Lyden, running casing 3065 ft.

Sinclair Oil Co.'s No. 1 G. W. Hill, ur 3405 ft.

The Texas Co.'s Nos. 3 Black Bros., ur 3244 ft; 6 Black Bros., sd 3168 ft; 1 Lila Martin, sd 3505 ft. Texas Northern Petroleum Co.'s No. 2 Walker & Caldwell, fsh 3007 ft.

S. P. Brown of Wichita Falls, who is connected with the Hughes Tool Company of Houston, was in Dallas this week attending the State Fair of Texas.

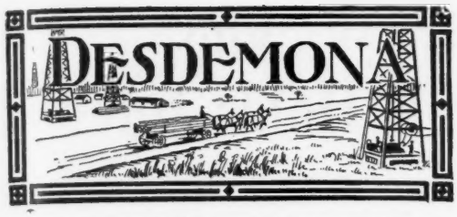
J. P. Flanagan, head of the Sinclair organization in Louisiana, was through Tulsa last week en route to New York City for a company conference.

J. B. Gilliland of the Gilliland Oil Company at Dallas, has been transacting company business in Tulsa during the past few days.

L. B. Elliott, sales manager of the Crude Oil Marketing Company at Wichita Falls, was a Tulsa visitor during the week.

A. E. Humphries of the Humphries Petroleum Company has been in Tulsa from his Denver headquarters during the past week.

R. T. Musser of the General American Tank Car Corporation has been transacting business in Tulsa during the past week. Musser makes his headquarters in Houston.



DESDEMONA PRODUCTION

The average daily production of the Desdemona field for the past week is divided about as follows:

	Barrels
Magnolia Petroleum Company	2,200
Humble Oil & Refining Company	700
Mid-Kansas Oil & Gas Company	175
Sinclair Consolidated	250
The Sun Company	190
Miscellaneous	6,390
Total	9,905
Last week	10,475

DESDEMONA COMPLETIONS

Empire Gas & Fuel Co.'s No. 1 S. L. Moore, abn after shot 3050 ft.

Sipe Springs Section

Cactus Oil Co.'s No. 3 D. S. Hale, abn 395 ft.

James et al's No. 1 Hood, abn 400 ft.

Shepherd et al's Nos. 1 Sanger Bros., abn 410 ft; 2 Sanger Bros., abn 430 ft.

Waxahachie Oil Co.'s No. A-1 Thompson, abn 2970 ft.

DESDEMONA WELLS NEARING COMPLETION

Fisher & Gilliland's No. 2 Lee Poteet, oil showing at 2800 ft, dr 2918 ft.

Magnolia Petroleum Co.'s No. 7 Reynolds, co after shot with hole bridged, 2751 ft.

Bay City Oil Co.'s No. 4-A Lewis, co after shot with hole bridged, 3120 ft.

Magnolia Petroleum Co.'s No. 3 W. R. Carruth, oil showing 2762 ft, dr 2769 ft.

DESDEMONA DRILLING REPORT

Collins & Gillett's No. 1 Sturkie, dr 3672 ft.

Prairie Oil & Gas Co.'s No. 1 Hodge, dr 2403 ft.

Iowa Bankers Oil Co.'s No. 1 Thomas Harris, sd 850 ft.

Mass-Tex Oil Co.'s No. 1 Hill, dr 447 ft.

Prairie Oil & Gas Co.'s Nos. 1 Max Kahn, sd 4150 ft; 1 James Quarles, dr 4141 ft.

Sinclair Gulf Oil Co.'s No. 5 Thornton, sd 2730 ft.

Texas & Pacific Coal & Oil Co.'s No. 1 Russell, dr 2291 ft.

Gulf Production Co.'s No. 1 Eppler, jarring on pipe 2817 ft.

Iowa Duke Oil Co.'s No. 1 Askew, ur 3232 ft.

Magnolia Petroleum Co.'s Nos. 4 Matthews, dr 1305 ft; 6 Moorhead, 3198 ft; 4 Odle, dr 2851 ft. Mid-Kansas Oil Co.'s Nos. 1 Dabney, dr 2941 ft; 1 Hogg, fsh 3315 ft.

Atlantic Oil Producing Co.'s No. 1-B J. D. Fields, setting casing 763 ft.

Martin Oil Co.'s No. 1 Gilbert, sd 3050 ft.

New Domain Oil Co.'s Nos. 3 Greenwood, dr 452 ft; 1 Puett, fsh 2200 ft.

Pittsburgh-Western Oil Co.'s No. 2 Puett, dr 1420 ft.

OFFERS $10 BARREL FOR CRUDE

Toyah, Texas, Oct. 14.—Jess Knight, manager of the small refinery recently erected here in connection with the Panhandle Electric Light & Power Company, announces he is ready to pay $10 a barrel for crude from the wells near Toyah. This crude has a high value for lubricating oils.

MEXICANS TO ATTEND MEETING

Houston, Texas, Oct. 20.—General Trevino of Mexico has appointed a committee of Mexicans now in Texas attending the Dallas State Fair, to attend the meeting of the Texas and Louisiana division of the Mid-Continent Oil and Gas Association in Wichita Falls, Saturday.

Four Hundred and Four Deep Wells in Comanche County

DALLAS, TEXAS, Oct. 20.—Four hundred and four wells, which had initial production of more than 200,000 barrels, are now listed in the Comanche County section as contributing to the daily average of more than 9000 barels which the field is producing. This includes only deep wells.

The Magnolia heads the list with 75 wells with the Humble Oil & Refining Company second with 41. The most productive lease in the field at the present time is the Magnolia's Hankins lease which is producing slightly less than 500 barrels a day. Other leases with as many as ten wells on them are producing less than 20 barrels a day.

The famous Ellison tract of the Humble Oil & Refining Company that had an initial production of nearly 20,000 barrels is now making around 300 barrels a day. It has 20 wells on it.

It was a week of abandonments in the Desdemona section with only a few wells nearing completion which gives promise of developing into even mediocre producers. However, there appears to be a ray of light in the area around the Puett-Greenwood-Fields wells where the only activity of note is under way. There the Whitesides well of the Ross-Goss-Fletcher interests is waiting to be shot after making considerable gas at 2900 feet and the Martin Oil Company's No. 1 Gilbert across the line in Eastland County is shut down for tools at 3050 feet and probably will be shot in the Caddo lime. These facts recorded and the news of the week also is recorded.

As evidence of the intention of operators to thoroughly test out the Caddo lime in the territory adjacent to the W. H. Puett well of the Pittsburgh Western, there is much activity on both this tract and the Greenwood and Fields tracts. The Pittsburgh Western's No. 2 W. H. Puett, an offset to the No. 1 well, is drilling at 1420 feet and the New Domain's No. 1 Puett is fishing at 2204 feet. This company is rigging up at their No. 2 well on the M. F. Greenwood tract and their No. 3 Greenwood is drilling at 452 feet. The Ohio Fuel Company is bringing in tools and the rig is on the ground for their No. 1 well on the Greenwood tract.

The Atlantic Oil Producing Company also is a major operator in this section. Drillers are setting 12½ inch casing at 763 feet in their B-1 J. D. Fields well and the lumber is on the ground for the B-2 J. D. Fields well. The B-1 well formerly was the Atlantic's No. 2 Fields and the B-2 was their No. 3 well on this tract. This company also is beginning operations on a sub-division of the M. F. Greenwood tract, on which the New Domain brought in a small well some time ago. The Atlantic drillers are spudding in the No. 1 Greenwood and the rig is up for their Nos. 2 and 3 Greenwood.

Among the near completions in the Desdemona section that give promise of production are the No. 2 well of Fisher and Gilliland on the Lee Poteet tract and the Magnolia's No. 3 W. R. Carruth. The former well has a showing of oil at 2800 feet and is drilling at 2918 feet. The latter well of the Magnolia has an oil showing at 2762 feet and drilling some 10 feet below that depth in the hope of striking production in quantity.

"Mexico Only Needs Money and Facilities to Double Oil Output"

DALLAS, TEXAS, Oct. 20.—Given sufficient capital and facilities, Mexico can double the world's production of crude petroleum.

That in short is the substance of a statement by Manuel L. Stampa, Mexican engineer, here during the Texas State Fair with the party of General Trevino and his staff. The party of Mexican officials was later joined here by General Alvaro Obregon, president-elect of Mexico.

The next president of the Southern republic and officials with him were guests of the State Fair and the city of Dallas. They were treated to a round of entertainment, including several banquets. Among other things, secret service officials of the Mexican government reported a plot to take the life of General Obregon.

But back to Mexico and its oil. Engineer Stampa says the total production of oil in 1919 was 473,000,000 barrels. Against that he says the wells of Mexico, if given a chance to flow at their capacity, would produce annually 881,000,000 barrels.

In the United States today there are 200,000 oil wells producing an average of five barrels daily. Against this, the Mexican engineer says his country has 334 producing an average of 7000 barrels each daily.

Senor Stampa is a graduate engineer of the University of Paris. He came with the party from Mexico to give information on the natural resources of his native country.

"In Mexico," said Senor Stampa, "there are 334 producing wells. There are 123 wells drilling and 147 locations made where drilling is to begin soon. No well flowing less than 1000 barrels daily is worked. No wells are pumped. Mexico is a land of flowing wells. Mexico has 75 exhausted wells. In all Mexico there are only 429 oil wells without production.

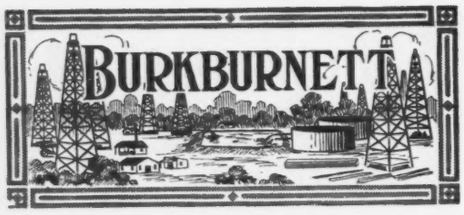
"The wells now producing in Mexico could, if permitted, produce more than 2,000,000 barrels daily. But transportation facilities must be increased to permit this. The pipe lines of Mexico have capacity for only 1,079,395 barrels. The lines are but 1300 miles in length. There is field storage for 32,000,000 barrels.

"And the Mexican oil fields need additional tankers to ply across the Gulf of Mexico. Three times as much tank capacity as is now in service could be used between the ports of Mexico and those of the other countries.

"It is estimated that Mexico has an oil area of 157,950,000 acres. Of this only 54,720 have been explored."

MAY CHANGE MEXICAN TAX SYSTEM

Tampico, Tamps., Oct. 21.—The Department of Treasury of Mexico is contemplating a change in the tax rate of petroleum exports, and may adopt plans for the payment of taxes every six months or one year, on a fixed basis for that time, in place of the present method of paying every two months on the price of oil in New York.



BURKBURNETT PRODUCTION

Daily production in the Burkburnett field was as follows during the past week:

	Barrels
The Texas Company	3,300
Texhoma Oil & Refining Company	2,500
Magnolia Petroleum Company	2,600
Gulf Production oCmpany	2,000
Gilliland Oil Company	1,600
American Refining Company	1,600
Oklahoma Petroleum & Gas Company	1,400
Panhandle Refining Company	1,000
Charles F. Noble	1,000
Humble Oil & Refining Company	1,400
Miscellaneous	46,900
Total	65,000
Last week	65,000

BURKBURNETT COMPLETIONS

Aggers Prod. Co.'s No. 5 Daniel, junked 1220 ft.

American Prod. Co.'s No. 6 Schmisseur, 60 bbls, 1810 ft.

Arco Oil Co.'s No. 1 Foster, abn, 1860 ft.

Brown & McCallister's No. 5 Ramming, 75 bbls, 1730 ft.

Buckhanan & Danciger's No. 1-A Michna, abn 1650 ft.

Burk Bates Pet. Co.'s No. 1 Herschi, abn 1870 ft.

Gold Bond Oil Co.'s No. 1 Pry, abn 790 ft.

Grand Duke Oil Co.'s No. 2 Holtzen, 60 bbls, 1650 ft.

Gulf Prod. Co.'s No. 2 Dodson, 60 bbls, 1260 ft.

Healdton Oil & Gas Co.'s No. 5 Evans, abn 1600 ft.

Jones Oil & Gas Co.'s No. 2 Rexford, 2,000,000 cubic feet gas, 1360 ft.

Kansas Gulf Oil Co.'s No. 2-D Heiserman, 120 bbls 1660 ft.

McMahon Oil Co.'s No. 8 River Bed, 150 bbls, 1570 ft.

Portland Texas Oil Co.'s No. 1 Roller, junked 1370 ft.

Ryan Pet. Co.'s No. 14 Waggoner, 75 bbls, 1650 ft.

Schlatterbach Oil Co.'s No. 1 Dodson, 1,000,000 cubic feet gas, 1480 ft.

Sheldon Lyons' No. 1 Taylor, 50 bbls, 1670 ft.

W. G. Skelly's No. 13-B Waggoner, 60 bbls, 1650 ft.

Staley, Langford & Chenault's Nos. 10 Ramming, 100 bbls, 1750 ft; 9 Brannon, 25 bbls, 1710 ft.

Texas Prod. & Ref. Co.'s No. 2 Renner, 50 bbls, 1750 ft.

NORTHWEST BURKBURNETT WELLS NEARING COMPLETION

The following wells in the Northwest Extension of the Burkburnett field are nearing completion, all being deeper than 1500 feet:

Aldine Oil Co.'s No. 1 Birk. American Prod. Co.'s No. 4 Schmisseur. Anderson Oil Co.'s No. 1 Schnockenberg.

Blackshear Texas Oil Co.'s No. 1 Schnockenberg. Brown & McCallister's No. 4 Ramming. Buckeye Pet. Co.'s No. 2 Sparks. Buckhanan & Danciger's No. 1-B Michna. Burk Cameron Oil Co.'s No. 4 Foster. Burk Key & Wilson Oil Co.'s No. 1 Chase. Burk Kinney Oil Co.'s No. 2 Michna. Burk Olden Oil Co.'s No. 1 Brannon.

Clay Sullivan et al's No. 1 Michna. Columbia Pet. Co.'s No. 1 Burk & Griffin. Couch & Winfrey's No. 1 Birk.

Danciger Oil & Ref. Co.'s No. 1 Michna.

Floyd Ward Pet. Co.'s No. 1 Schnockenberg.

General Oil Co.'s No. 5-A River Bed. Groves et al's No. 1 Foster. Green & Waggoner's No. 1 Ferguson.

Gulf Prod. Co.'s Nos. 3 Elsea, 10 Michna, 1 Chapman and 2 Walling.

Hamilton Oil Co.'s No. 1 Heiserman. Hayworth Oil Co.'s No. 1 Burkburnett. Hazeltine Danciger Oil Co.'s No. 1 Michna.

Jupiter Pet. Co.'s No. 1 Siber.

Kansas Gulf Oil Co.'s No. 1 Holtzen. Kenoka Oil Co.'s Nos. 1 and 2 Fowler. Knight et al's No. 2 Birk.

Lipscomb, Burbank & Ford's No. 1 Allen. Louisiana Burk Oil Co.'s No. 1 Holtzen.

McMahon Oil Co.'s Nos. 5 River Bed and 1 Taylor. Magnolia Pet. Co.'s Nos. 9 and 10 Ramming, 28, 29 and 31 Ramming. Moody Pet. Co.'s No. 3 Schmisseur. Mantour Oil Co.'s No. 1 Siber.

Nortex Oil Co.'s No. 7 Evans.

Oscar Dunningan's No. 1 Chapman. Overland Oil Co.'s Nos. 1 and 4 Myers.

Panhandle Ref. Co.'s No. 2-B Morgan. Pollaska Oil Co.'s No. 1 Elsea. Powell et al's No. 1 Foster. William Priddy's No. 2 Burk Burnett.

Ranger Extension Oil Co.'s No. 2 Renner. Rockhill & Danciger's No. 1 Chase.

Security Prod. oC.'s No. 1 Morgan. Seaboard Oil & Gas Co.'s No. 1 Michna. Siderman Oil Co.'s No. 1 Kinnison. W. G. Skelly's Nos. 1 Elsea and 2 Ramming. Skyline Oil Co.'s No. 2 Holtzen. Smith et al's No. 1 Taylor. Spur Oil Co.'s No. 1 Herschi. Staley, Langford & Chenault's Nos. 11 Ramming, 13, 14, 15, 16, 17 and 18 Schmisseur. State Oil & Gas Co.'s No. 1 Taylor. Steiner Oil Corp.'s No. 2 Siber. Summitt Pet. Co.'s No. 1 Foster.

Tenn Oil Co.'s No. 2 Evans. Texas Prod. & Pet. Co.'s No. 4 Renner. Texas & Okla. Pet. Co.'s No. 3 Elsea. Texas Oil Prod. & Ref. Co.'s No. 1 Morgan.

United Drilling & Dev. Co.'s No. 1 Herschi. Universal Drilling Co.'s No. 1 Schroder. Underwood Drilling Co.'s No. 2 Foster.

West Penn Oil Co.'s No. 3 Elsea. G. A. Work's No. 1 Myers. Womack Oil Co.'s No. 2 Roberts.

SOUTHEAST BURKBURNETT DRILLING REPORT

Burk Serrian Oil Co.'s No. 3 Powell, sd 1310 ft.

Carlisle Ryan's No. 1 Donohoe, sd 1230 ft. Chiesa Oil Co.'s No. 2 Beach, dr 1360 ft.

D. S. Donovan's No. 1 Miller, sd 1500 ft.

E. M. F. Oil Co.'s No. 5 Roller, dr 1000 ft

Franklin Drilling Co.'s No. 1 Dodson, dr 1330 ft. Fuller Oil Co.'s No. 1 Donohoe, dr 800 ft.

Gulf Prod. Co.'s No. 4 Daniel, dr 600 ft.

Invader Oil & Ref. Co.'s Nos. 8 Daniel, dr 1260 ft; 9 Daniel, dr 1000 ft.

Monarch-Emerick Oil Co's No. 4 Roller, sd 1200 ft; 5 Roller, dr 1280 ft.

Monarch Pet. Co.'s Nos. 1 Myers, fsh 1330 ft; 18 Willis, sd 1300 ft; 22 Daniel, dr 500 ft.

O'Dell Oil Co.'s Nos. 3 Beach, sd 1240 ft; 7 Beach, dr 1240 ft; 8 Beach, dr 1100 ft.

Penna Burk Oil Co.'s No. 1 Willis, sd 780 ft.

Quanah Oil Co.'s No. 6 Roller, dr 1240 ft.

Rogers Ref. Co.'s No. 1 Albright, sd 1010 ft.

Shaffer & Mankins' No. 1 Whive, testing sand, 1210 ft. Stump Oil Co.'s No. 2 Beach, dr 1250 ft.

Texana Prod. Co.'s Nos. 5 Dodson, sd 780 ft; 6 Dodson, sd 1180 ft.

Texas Gusher Oil Co.'s No. 1 Livermore, dr 1800 ft.

Texhoma Oil & Ref. Co.'s Nos. 3 Dodson, sd 1500 ft; 5 Dodson, sd 1450 ft; 9 Dodson, sd 1210 ft; 6 Willis, sd 1270 ft; 7 Willis, dr 1000 ft; 2 Roller, sd 1225 ft; 6 Roller, dr 600 ft.

Law Enforcement in Wichita County Fields Holds Interest

WICHITA FALLS, TEXAS, Oct. 20.—Law enforcement vied with events in the oil fields for first consideration in the Wichita Falls district during the week.

Texas Rangers, some of them already on the ground, are reported as being ready to supplant county officers in the oil fields. This all follows the indictment of several deputy sheriffs for bribery and other similar charges. These actions took officers out of the fields and outlaws have had their way. Robberies, holdups and shooting scrapes have been frequent.

But rig crews are working right along. The Cezreaux and Bissionett test on the Parkey farm, Archer County, continues to hold chief interest. It remains as it was last reported when salt water broke in, after the well had bailed oil for two days. Plans are now to set a packer in the bottom of the hole. Bottom water is considered the source of the trouble.

This well, which is five miles southeast of the K-M-A field, is similar to the early wells in the K-M-A field. After the first well in that field, later tests found water trouble and for several months it seemed that the field was hopeless. Drillers finally learned how to avoid the thin sand with the water beneath it and the field was made to do its share in producing oil.

The Alberta Oil Co.'s No. 2 Ferguson, between the Archer County test and the K-M-A field, is still shut down to be put on the pump.

Over in the Northwest Extension of the Burkburnett field, the Spur Oil Company's No. 1 Herschi in block 834 gives promise of being a small producer. This well, which is in semi-wildcat territory, has 800 feet of oil in the hole. It is north and west of three Bowers pool, being farther still toward the old Electra pool.

Bad weather, in the form of a heavy rain, gripped the fields early in the week and caused operations to be cut down. North Texas fields are soon to feel the touch of cold weather. Production and drilling will no doubt suffer from the cold season.

Cost of Drilling Oil Well in Mountain District High

Denver, Colo., Oct. 15.—(Special)—Prospecting for oil or gas in intermountain territory is no piker's game. The average cost of a hole 3000 feet deep in a producing district with ordinary good luck is about $40,000. In wildcat territory, it will run about $10,000 higher.

A standard 82-foot derrick, complete with rig irons, costs approximately $5000. Drillers receive from $10 to $12 a day and board and "toolies" get $8.00 and $10.00 a day and board. Teamsters pull down $16.00 a day for four-up and $10.00 a day for a two-horse team. The average cost of fuel oil is $2.75 per barrel while gas is from 2 to 5 cents per 1000 and is much cheaper than fuel oil when available. Where a test is drilled by contract, the ruling price in the older districts for a hole less than 2000 feet in depth is $5.00 per foot while for a test 3000 feet in depth or more it runs from $6.00 to $7.00 per foot.

The following figures were furnished by the Producers and Refiners Corporation on a 3000-foot test which it completed at Sand Draw, Wyoming, as a gas well:

Casing	$17,189.71
Labor	15,644.15
Fuel	5,237.50
Standard rig	3,498.90
Teaming	2,155.30
Miscellaneous items	365.80
Total	$44,091.36

There were six strings of casing used in this well: 29 feet of 20-inch; 753 feet of 15½-inch; 1029 feet of 12½-inch; 2000 feet of 10-inch; 2235 feet of 8¼-inch and 2500 feet of 5 3-16-inch. Where so many strings are used, usually all but the two smaller ones are recovered from the hole and may be used several times.

MISCELLANEOUS PRODUCTION

The daily average of production in the smaller fields of North Texas was divided as follows last week:

	Barrels
Kemp-Munger-Allen	4950
Iowa Park	750
Young County	625
Petrolia	350
Holliday	175
Total	6850
Last week	8465

K-M-A COMPLETIONS

Bass & Dillard's Nos. 4 K. & K., 80 bbls, 1770 ft; 5 K. & K., 100 bbls, 1760 ft.

Haynes & Cannon's No. 2-C Munger, abn 1760 ft.

K-M-A Oil Co.'s No. 2 Munger, abn, 1780 ft.

Scay Stone Oil Co.'s No. 5 K. & K., 100 bbls, 1770 ft.

K-M-A DRILLING REPORT

Alberta Oil Co.'s No. 2 Ferguson, to put on pump 1750 ft. American Dev. Co.'s No. 1 Griffin, dr 1630 ft.

Bland Oil Co.'s No. 2 Munger, sd 1730 ft. Burkburnett Van Cleve Oil Co.'s Nos. 1 Ferguson, sd 1700 ft; 1 K. & K., dr 1540 ft.

Cline Oil Co.'s No. 9 Munger, dr 1690 ft.

Dee & Belport's Nos. 2 Mangold, sd 1830 ft; 3 Mangold, sd 1430 ft.

Gulf Prod. Co.'s No. 1 Lewis, dr 1725 ft.

Haynes & Cannon's Nos. 4-B Munger, dr 1440 ft; 5-B Munger, sd 1740 ft; 1-C Munger, sd 1760 ft. Hill & Roberts' Nos. 2-A K. & K., fsh, 1760 ft; 1-C K. & K., dr 1100 ft.

Jimmie Jones Oil Co.'s No. 4 Munger, sd 1730 ft.

Krank & Belport's No. 1 Mangold, sd 1820 ft.

Occidental Oil Co.'s No. 3 Munger, sd 1730 ft.

Piedmont Oil Co.'s No. 1 Mangold, dr 1640 ft. Porter Oil Co.'s No. 1 K. & K., dr 900 ft.

J. Rogers Oil Co's No 1 Mangold, dr 1620 ft

Shappel & Langford's No. 3 K. & K., dr 1600 ft. Smith et al's No. 1 Porter, dr 1760 ft. Southern Prod. Co.'s No. 1 Munger, sd 1750 ft

Texhoma Oil & Ref. Co.'s Nos. 4 K. & K., sd 1750 ft; 6 K. & K., dr 470 ft; 1-C K. & K., sd 1730 ft; 1-D K. & K., dr 900 ft. Tillicum Oil Co.'s No. 1 Parker, sd 1310 ft.

Universal Oil Co.'s No. 1 Lewis, dr 1940 ft.

Verner Oil Co.'s No. 1 Bowers, rigging up.

Walker Consolidated Pet. Co.'s Nos. 1-B K. & K., sd 1640 ft; 4-B K. & K., dr 1100 ft; 1-D K. & K., sd 1760 ft; 2-D K. & K., dr 1200 ft; 2 Bowers, dr 1000 ft.

Wallace & Porter's No. 1 K. & K., sd 1740 ft. W. T. Willis' No. 1 Lewis, sd 1740 ft

COMPANY SECURES THREE NEW LEASES AT IOWA PARK

Wichita Falls, Texas, Oct. 20.—Three leases, each of 40 acres, have been added to the holdings of the Griswold Oil Company in the Iowa Park field. This gives the company 220 acres in the proven area of the field.

One of the leases, bought from the Como Oil Company has four producing wells at present. The other two are undrilled. Plans of the company are to start an extensive drilling campaign on the whole property.

The leases were bought following the visit of Dr. Eugene Christian, vice president of the company, to the properties at Iowa Park. At first it was considered to enter the deeper fields of North Texas for further operations.

The oil depth on the property bought is 860 feet. Star machines will be used for drilling.

The company has just completed its 16th well on the Zink property, a 40-barrel producer.

The third quarterly dividend of the company is to be paid this month. It will be three per cent.

ELECTRA DRILLING REPORT

Anaconda Oil Co.'s No. 1 McCarty, sd 1860 ft. Arcadia Oil Co.'s No. 2 Burnett-Lloyd, rigging up.

Big Dome Oil Co.'s No. 1 Peden, sd 2500 ft. Brinkley Prod. Co.'s No. 1 Bradley, sd 1850 ft. Buffalo Texas Oil Co.'s No. 9 Douglass, sd 1050 ft.

Cauble Oil Co.'s No. 2 Dale, sd 2360 ft; 1 Tuttle, fsh 1750 ft.

Federal Oil Co.'s No. 1 Baker, sd 1700 ft.

Gladolius Oil Co.'s Nos. 9 Burnett, dr 700 ft. Goddard & Holcomb Oil Co.'s No. 1 Burnett, sd 1170 ft. Gulf Prod. Co.'s Nos. 4-C Burnett, sd 1460 ft; 11-A Burnett, sd 330 ft; 10 Word Burnett, sd 1520 ft; 3 Collett, dr 400 ft.

Hazel Burk Oil Co.'s No. 1 Ausperger, fsh 2570 ft.

International Pet. Co.'s No. 1 Burnett, sd 810 ft. International Crude Oil Co.'s No. 1 Douglass, sd 1270 ft.

Roy B. Jones' No. 11 Burnett, setting casing 1930 ft.

Lawton Oil Co.'s No. 1 Guthrie, rigged up. Linn Cook Oil Co.'s No. 2 Waggoner, sd 1520 ft. Lucky Thirteen Oil Co.'s No. 2 Canto, sd 850 ft.

W. J. McCauley's No. 1 Griffin, dr 360 ft. H. F. McGuire's No. 1 Brenner, sd 900 ft.

Old Dominion Oil Co.'s No. 1 Banata, sd 2560 ft.

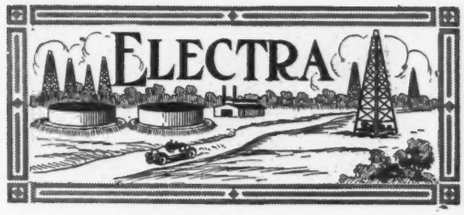
Planet Pet. Co.'s No. 3 Waggoner, sd 1660 ft.

Ryan Pet. Co.'s Nos. 3 Nance, sd 1870 ft; 4 Nance, co 1400 ft; 1 Bradley, dr 1660 ft.

Star State Oil Co.'s No. 1 Wallace, sd 1740 ft. Superior Oil Co.'s Nos. 2 Burnett, sd 1400 ft; 3 Burnett, sd 1400 ft.

H. T. Tyson's No. 1 Bradley, sd 50 ft.

Weimer Oil Co.'s No. 1 Ancell, sd 1800 ft.



ELECTRA PRODUCTION

Production in the Electra field showed the following daily total during the past week:

	Barrels
Magnolia Petroleum Company	4,200
The Texas Company	4,000
Gulf Production Company	700
Panhandle Refining Company	125
Miscellaneous	1,575
Total	10,600
Last week	10,600

ELECTRA COMPLETIONS

Gladolius Oil Co.'s No. 8 Burnett, 100 bbls, 950 ft.

Barr Davis Oil Co.'s No. 5 Burnett, 25 bbls, 970 ft.

Magnolia Pet. Co.'s No. 38 Piper, 50 bbls, 1780 ft.

Planet Pet. Co.'s No. 6 Burnett, 175 bbls, 950 ft.

Ryan Pet. Co.'s No. 2 Nance, abn, 1860 ft.

TO DEVELOP 2430 FOOT SAND IN K-M-A FIELD

Wichita Falls, Texas, Oct. 20.—Another promising test in the territory surrounding the Kemp-Munger-Allen field showed a small amount of salt water last week after bailing oil for two days. This test is being drilled by William Holden on the Pettit ranch across the Wichita river from the two producing wells completed several months ago by the Dundee Oil & Development Company on the Tidwell property.

The Holden well found a producing stratum at 2430 feet. Small amounts of oil were bailed at first. Later salt water began to show. The owner has announced that he will try to save this well. In case this fails, he will drill a second well near the first location.

The well is four and one-half miles northwest of the K-M-A field proper. It is 700 feet deeper than the K-M-A sand. It is 600 feet deeper than the two wells on the Tidwell property.

Another Producer in Young County Below 4000 Feet

DALLAS, TEXAS, Oct. 20.—Another deep well for Young County and the best one yet completed there, was registered Monday with the completion of the Southwestern Miami Oil & Development Company's No. 1 McKeen for 100 barrels, flowing at 4010 feet.

This well is across the Clear Fork of the Brazos river to the north of the South Bend country. The South Bend wells are producing from sands, varying in depth from 1850 to 2450 feet. The new well was drilled to the lime. At 4000 feet it showed a spray of oil and considerable gas. When drilled 10 feet deeper the gas increased to 4,000,000 cubic feet. With it 100 barrels of oil flowed.

First production in Young County, The Texas Company's No. 1 Arnold, came from the lime formation below 4000 feet. This well, however, and other deep ones were all small in production. They have flowed steadily for several months.

The Panhandle Refining Company's No. 1 McCluskey in the South Bend district, a sand producer at 2435 feet, remains the best well in the county. It is still flowing 200 barrels daily, having been completed last July. In addition its gas is being used as fuel for other wells drilling nearby.

Up in Archer County the deepest well ever drilled in North Texas was abandoned last week. W. W. Silk and associates drilled the test on the Scott tract to 5000 feet. It was a cable tool test. When the well was abandoned, a statement was issued that the well never gave hope of being a producer.

Work was resumed during the week on the Hale & Todd test on the Hoyle farm near Chico in Wise County. This well was reported to have had considerable oil in the hole several weeks ago. It was shut down at 1840 feet for 6-inch casing, which is now being set, in preparation for a test.

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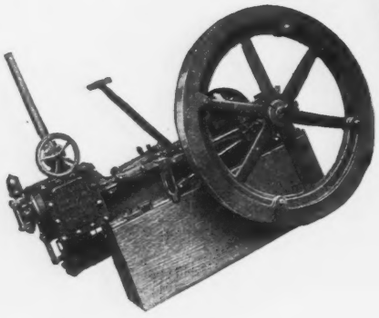

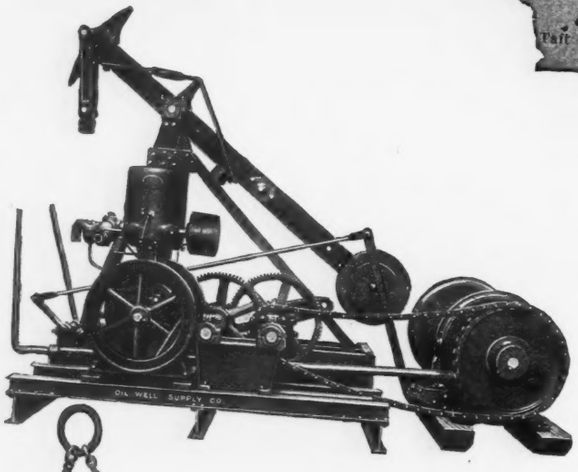

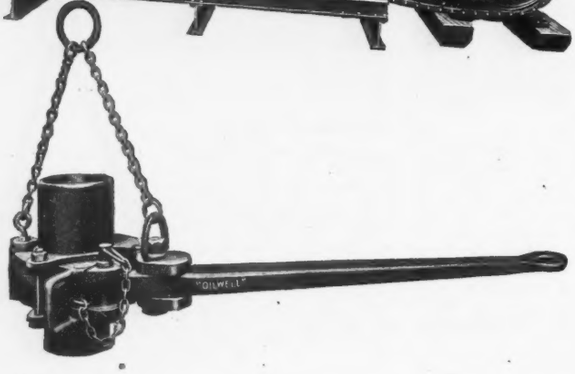

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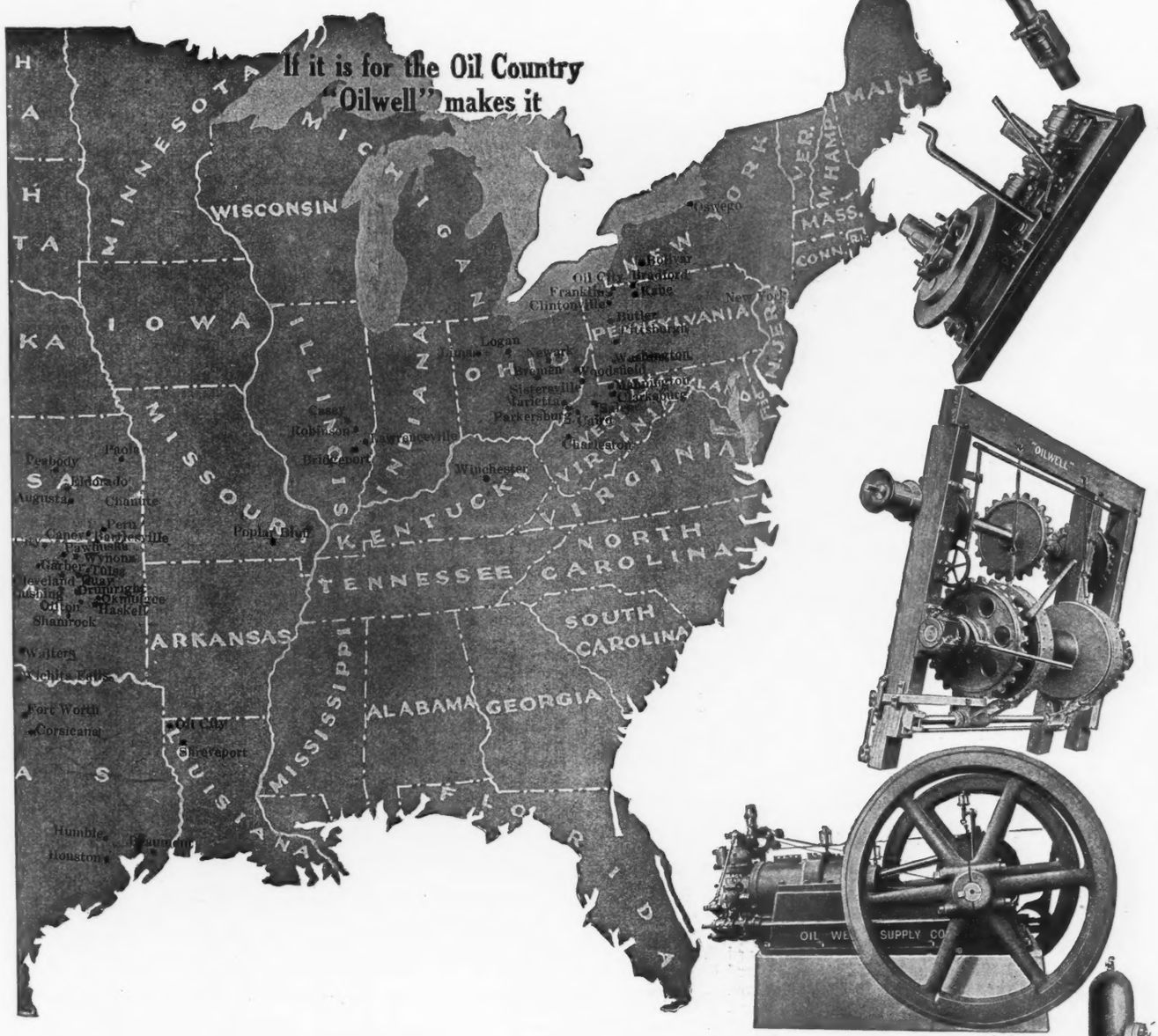

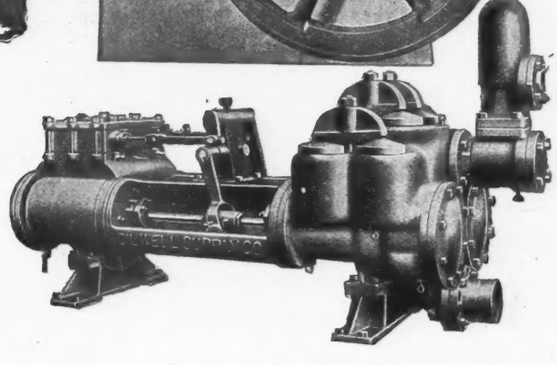

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Bradford, Pa. — Pittsburgh, Pa. — Oswego, N. Y.
Poplar Bluff, Mo. — Oil City, Pa. — Parkersburg, W. Va.
Los Angeles, Cal. — Tulsa, Okla.

KANSAS PRODUCTION

The average daily production of the Kansas field for the past week was distributed approximately as follows:

	Barrels
Eldorado	32,800
Augusta	10,500
Elbing-Peabody	30,100
Other fields	18,000
Total	91,400
Last week	94,300

KANSAS COMPLETIONS

Allen County

E. E. Everest's No. 3 Dahl, northeast 24-26-20, 20 bbls.

Garland Oil Co.'s No. 2 Trast, northeast 16-26-21, 75 bbls; 3 Trast, 75 bbls; 1 Trast, 75 bbls.

Henman et al's No. 1 Larsen, northwest 15-26-21, 100 bbls.

W. E. Laughner et al's No. 5 Wadley, southeast 10-26-10, 15 bbls.

F. Morrison et al's No. 1 Johnson, 10-26-19, 70 bbls.

C. A. McCay's No. 8 Liberty, southwest 17-26-18, 10 bbls.

Tellman Oil Co.'s No. 8 Glover, northeast 16-26-18, 15 bbls.

Chautauqua County

J. R. Barnes & Co.'s No. 1 Yeoman, northeast 33-34-10, abn 1562 ft.

William Bell et al's No. 7 Butcher, northwest 36-33-10, 30 bbls, 1409 ft.

Elgin Oil & Gas Co.'s No. 22 Cockus, southeast 9-35-10, 25 bbls, 1458 ft.

W. F. Lemon's Nos. 1 Lemon, northwest 17-35-10, abn 1510 ft; 10 Lemon, 30 bbls, 1495 ft; 11 Lemon, abn 1499 ft.

W. H. Sproul's No. 16 Crane, south half 1-35-11, 40 bbls, 1203 ft.

Franklin County

Bonnie Oil & Gas Co.'s No. 5 Lord, southeast 8-17-21, abn.

W. M. Bovacid's No. 7 Carter, northwest 17-18-21, 3 bbls.

Robert Mabier's No. 3 Seymour, northwest 28-17-21, 1,500,000 cu ft gas.

Phillips Petroleum Co.'s No. 2 Hoyle, southeast 12-18-20, 2 bbls.

Sentinel Oil & Gas Co.'s No. 6 Hughes, northwest 33-17-21, 20 bbls.

Tedlock & Stuart's No. 1 Bussell, northeast 5-18-21, 10 bbls.

Greenwood County

J. F. Darby's No. 1 Pinon, northeast 27-23-13, 50 bbls, 1600 ft.

Darby et al's Nos. 2 Shambough, 22-23-13, 100 bbls, 1587 ft; 1 Burt, northwest 19-25-9, abn.

Great Southern Oil Co.'s No. 1 Robin, south half 27-25-8, 25 bbls.

Kansas & Gulf Co.'s No. 1 Burt, southwest 12-24-9, abn.

Mid-Kansas Oil & Gas Co.'s No. 1 Bryden, northeast 31-25-9, 125 bbls.

Skelly-Inland Oil Co.'s No. 2 Noler, northeast 16-23-9, 25 bbls.

Marion County

Elmerdale Oil Co.'s No. 1 Bathwell, northwest 5-22-4, 30 bbls, 2493 ft.

Orlando Pet. Co.'s No. 2 Elmstead, southeast 10-22-4, 60 bbls, 2530 ft.

Ward et al's No. 1 Booth, northeast 31-21-4, abn 2535 ft.

Robert Watchorn's Nos. 4 Joliffe, southwest

New Pools in Kansas Add Materially to the State's Production

By Spencer Robinson

TULSA, OKLA., Oct. 19.—The two newest Kansas pools, the so-called Covert-Sellars district in 21-4 and the Urschel pool in 21-5, are aiding materially in holding up the production of the state, with total combined daily runs of 16,700 barrels, according to last week's records. Both of the pools are in the southern part of Marion County, and have been largely developed since July of this year.

The Covert-Sellars pool, found by a well completed in April on the Sellars farm for 590 barrels, is the oldest of the two pools and has the largest production. According to the following list, which shows the number of completed wells up to October 1, the pool has a total of 40 producing wells with a combined initial production of 17,807 barrels.

Over half of the wells within the proven limits of the field are showing some water, though none of the wells so far have gone completely to the bad. The oil is made marketable by settling and steam treating. As the wells are not allowed to flow at full capacity, it is thought that the water can be kept under control.

Although the pool has been fairly defined on its northeast and eastern sides by dry holes, there is a considerable area to the west and north that is yet to be proven. Activity is steadily increasing and the pool has prospects of being further extended into more profitable sections.

With the water encroachment on the Covert-Sellars district, attention is being turned to the Urschel pool in 21-5, which is really an eastern extension of the Florence field. In this pool only two wells are showing water, and in both instances the wells were drilled through the oil sand into water.

The Merriam-Findeiss well on the Urschel tract, completed in August for 3000 barrels or over, is the district's discovery well, and all succeeding wells likewise have shown large initial and an unusual holding-up of the flush production. The original Florence pool is separated partially from the new pool by a fence of dry holes. The daily average production for both pools totals 4500 barrels.

The following list shows the wells completed in the Covert-Sellars and Florence districts up to and partly through September. Since this time several large producing wells have been brought in in both sections, among them the 4500 barrel well of the Ramsey Petroleum Company on the Miller lease in the center of the Covert-Sellars pool. This well is the largest one completed in this section, and one of the largest brought in in the Kansas fields during the year. The list follows:

COVERT-SELLARS POOL

Company and Well	Location	Date of Completion	Depth	Initial Production
Bird & Titus' No. 1 Miller	21-21-4	7-27-20	2412	894
Bird & Titus' No. 2 Miller	21-21-4	8-16-20	2419	680
Bird & Titus' No. 3 Miller	21-21-4	9-7-20	2406	912
Carter Oil & Ward's No. 1 Sellars	28-21-4	4-28-20	2396	590
Elmerdale Oil Co.'s No. 1 Sands	29-21-4	9-16-20	2431	218
Gypsy-Phillips' No. 1 Beach	20-21-4	7-27-20	2407	900
Gypsy-Phillips' No. 2 Beach	20-21-4	9-28-20	2388	306
Gypsy-Phillips' No. 3 Beach	20-21-4	9-28-20	2399	280
Margold Oil Co.'s No. 1 Piper	21-21-4	7-12-20	2400	730
Margold Oil Co.'s No. 3 Piper	21-21-4	9-16-20	2394	130
National Refining Co.'s No. 1 Ramsey	20-21-4	8-16-20	2398	410
National Refining Co.'s No. 3 Ramsey	20-21-4	9-20-20	2408	310
National Refining Co.'s No. 4 Ramsey	20-21-4	9-28-20	2414	300
National Refining Co.'s No. 1 Stovall	28-21-4	6-21-20	2396	300
National Refining Co.'s No. 2 Stovall	28-21-4	5-24-20	2374	630
National Refining Co.'s No. 3 Stovall	28-21-4	5-29-20	2391	708
National Refining Co.'s No. 4 Stovall	28-21-4	6-21-20	2418	207
National Refining Co.'s No. 5 Stovall	28-21-4	7-12-20	2410	280
National Refining Co.'s No. 6 Stovall	20-21-4	7-19-20	2407	410
National Refining Co.'s No. 7 Stovall	20-21-4	7-19-20	2407	510
National Refining Co.'s No. 9 Stovall	21-21-4	9-20-20	2410	360
Ramsey Petroleum Co.'s No. 1 Miller	21-21-4	7-27-20	2400	680
Ramsey Petroleum Co.'s No. 2 Miller	21-21-4	9-7-20	2413	512
Ward & Lansford's No. 2 Piper	21-21-4	9-20-20	2385	400
Ward & Lansford's No. 3 Piper	21-21-4	9-28-20	2372	240
Ward & Lansford's No. 1 Miller	21-21-4	7-22-20	2398	788
Ward & Wilhoit's No. 2 Covert	28-21-4	5-24-20	2349	518
Ward & Wilhoit's No. 5 Covert	21-21-4	7-6-20	2358	480
Ward & Wilhoit's No. 1 Covert	28-21-4	7-7-20	2408	495
Ward & Wilhoit's No. 3 Covert	28-21-4	7-25-20	2393	210
Ward & Wilhoit's No. 6 Covert	21-21-4	7-19-20	2397	600
Ward & Wilhoit's No. 4 Covert	28-21-4	6-7-20	2418	207
Ward & Wilhoit's No. 7 Covert	28-21-4	8-16-20	2406	909
Ward & Wilhoit's No. 8 Covert	21-21-4	9-7-20	2382	112
Ward, Wilhoit & Hubbard's No. 2 Holder	21-21-4	9-17-20	2406	685
White Oil Corporation's No. 3 Sellars	21-21-4	7-6-20		
(Showing of oil at 2506 feet; drilled deeper and got water at 2600 feet.)				
White Oil Corporation's No. 4 Sellars	21-21-4	8-30-20	2388	207
White Oil Corporation's No. 5 Sellars	21-21-4	9-12-20	2369	912
White Oil Corporation's No. 1 Sellars	21-21-4	8-27-20	2407	290
White Eagle Oil & Ref. Co.'s No. 1 Piper	28-21-4	9-7-20	2414	210
White Eagle Oil & Ref. Co.'s No. 2 Piper	28-21-4	9-28-20	2419	207

New Well in South Okmulgee Looks Like Extension to Field

TULSA, OKLA., Oct. 20.—Transcontinental Oil Company has a well in 14-12-12, southern Okmulgee County, that brings that district into the spotlight again, and indicates a new extension to the south and west of at least three-quarters of a mile. The well is not yet completed, but is reported making hour heads, flowing about 150 barrels a day.

A further interesting feature of the Transcontinental's well is that it is producing from a sand at 2250 feet, where the production to the north and east has been from the 1100 foot level. It may therefore lead to the uncovering of a new pool in this township.

Waite Phillips added two more to his list of good wells in the Phillipsville pool last week when he drilled in a couple of tests on the Jane Reed lease in section 22-14-11. One of the wells is credited with 1500 barrels initial, and the other for 500 barrels, both from the Wilcox sand. While this estimate is likely far above what the wells will actually show when fully completed, they are both good wells, and will further add to the glory of this little wonder pool.

In 28-13-13, the Blue Rock Oil Company has a test at the top of the pay at 2003 feet, making a good showing of oil.

Probably the most important development in the Okmulgee general territory during the past two weeks was the No. 2 Compton of Foltz et al, south of Muskogee, in what looked like was a fluke field. The well was credited with 600 barrels in this column last week, but later and more conservative estimates put the production at 200 barrels initial. It is undoubtedly a good well, and producing from a sand at 650 feet, together with the fact that it is especially high grade oil, makes it look especially attractive. Efforts so far to find outlets to the pool have met with sore discouragement, as half a dozen tests drilled in the same territory passed up the 650 foot level without getting anything. It may be, however, that the pool will yet be outlined, and prove as flattering as at first hoped.

In Okfuskee County the Central National Oil Company got a 300 barrel well at 2645 feet, in 15-11-11, and in the same section the Kingwood Oil Company got a 150 barrel well. In the section to the west the Kingwood got another good well, rated at 125 barrels.

Other operations in these fields during the week were confined to inside stuff, and completions were of the ordinary size.

OKLAHOMA PRODUCTION

A small increase was shown in this week's production figures of the Oklahoma fields. The daily average for the week was distributed about as follows:

	Barrels
Healdton-Hewitt	51,300
Cushing-Yale	41,400
Garber-Billings	11,600
Other fields	192,600
Total	296,900
Last week	298,500

OKMULGEE SECTION COMPLETIONS

Okmulgee County

Atlantic Pet. Co.'s No. 9 Bearhead, 19-15-11, 350 bbls, 3098 ft; 12 Drew, northeast 18-15-11, 40 bbls, 2990 ft.

Beets Oil & Gas Co.'s No. 4 Beets, southwest 32-12-11, 4,000,000 cu ft gas, 2015 ft.

Bodkins et al's No. 1 Stephens, southwest 28-13-13, 10 bbls, 1478 ft.

E. R. Black's No. 2 McHenry, southwest 16-14-11, abn 2997 ft.

Burk Pet. Co.'s No. 1, northeast 22-13-12, 100 bbls, 2010 ft.

Best Prod. Co.'s No. 5 Adams, northwest 11-15-11, 40 bbls, 1770 ft.

Copeland et al's No. 5 Alexander, northwest 27-13-13, 20 bbls, 1418 ft.

Canuth's No. 1 Hayden, northeast 28-13-13, 20 bbls, 1885 ft.

Catlett et al's No. 3 Hill, southeast 23-15-11, 10 bbls, 2730 ft.

Detrich et al's No. 1 Bean, southeast 14-12-12, good show, 2250 ft.

Gladys Belle Oil Co.'s Nos 7 Thornberg, northeast 22-14-11, 12 5bbls, 2870 ft; 9 Thompson, northeast 22-14-11, 200 bbls.

Galloway et al's No. 4 Brunner, southeast 8-14-11, 5 bbls, 2463 ft.

Galli Curci Oil Co.'s No. 2 Johnson, southeast 29-14-11, 10 bbls, 2390 ft.

Hill et al's No. 2 Doyle, northwest 20-13-14, 500,000 cu ft gas, 2065 ft.

Link Oil Co.'s No. 3 Thompson, northeast 17-14-15, 1,000,000 cu ft gas, 1650 ft.

Lucky Tiger Oil Co.'s No. 8 Rentie, northwest 35-15-14, 100 bbls, 2135 ft.

National Oil Co.'s No. 3 Lane, northeast 28-13-13, 30 bbls, 2015 ft.

No. 1 Oil Co.'s No. 1 Yargee, southwest 18-14-11, abn 3122 ft.

Waite Phillips' No. 1 Lungsford, northwest 20-14-11, 90 bbls, 2430 ft.

Waite Phillips' No. 8 Crossland, southeast 22-14-10, 200 bbls, 2755 ft; 9 Crossland, in the same, 15 bbls, 2208 ft.

Prod. & Ref. Corp.'s No. 1 White, southwest 15-14-11, 80 bbls, 2230 ft.

Riverland Oil Co.'s No. 3 Blunt, southeast 11-14-11, 10,000,000 cu ft gas, 1995 ft.

Shaffer Oil & Ref. Co.'s No. 3 Brunner, in southwest 8-14-11, abn 3072 ft.

Test Oil Co.'s No. 13 Jefferson, southwest 29-13-14, 15 bbls, 1628 ft.

Tangeman et al's No. 1 Adams, northwest 8-14-12, 40 bbls, 2262 ft.

Transcontinental Oil Co.'s No. 1, southeast 14-12-12, flowing by heads, 150 bbls, 2251 ft.

Muskogee County

Grand Duke Pet. Co.'s No. 4 Barnett, northwest 10-14-18, 80 bbls, 1536 ft.

Haskogee Oil Co.'s No. 3 Reed, northwest 16-14-17, abn 1500 ft; 2 Newman, northwest 16-14-17, 5 bbls, 1392 ft.

Nelson et al's No. 1 Sweedle, southwest 7-14-19, abn 1100 ft.

Powell et al's No. 5 Barnett, northwest 10-14-18, 20 bbls, 1545 ft.

Rogers County

Aulat & Ross' No. 18 Fee, northwest 2-24-17, 2 bbls.

T. B. Slick's No. 11 House, northeast 11-24-16, 3 bbls.

Okfuskee County

J. J. Deaner et al's No. 4 Tucker, 15-11-11, 100 bbls, 2508 ft; 2 Taylor, in the same, 75 bbls, 2397 ft.

Central National Oil Co.'s No. 10 Carter, southwest 15-11-11, 300 bbls, 2645 ft.

Kingwood Oil Co.'s No. 9 Holmes, southeast 15-11-11, 150 bbls, 2535 ft; 3 Holmes, northeast 16-11-11, 125 bbls, 2678 ft.

Solo Oil Co.'s No. 1 Targole, southeast 12-12-10, 10 bbls, 2670 ft.

Wagoner County

Texolean Oil Co.'s No. 1 Washington, southwest 32-17-18, 3,000,000 cu ft gas, 1250-60 ft, 3,000,000 cu ft gas 2190-2250 ft, 25 bbls oil, 2335 ft.

Dekoma Dev. Co.'s No. 1 Island, northwest 33-17-16, abn 1704 ft.

Sargent et al's No. 1 Darby, northeast 25-17-15, abn 1372 ft.

FLORENCE POOL

Company and Well	Location	Date of Completion	Depth	Initial Production
Gypsy & Phillips'	18-21-5	8-13-20	2412	380
Gypsy & Phillips' No. 3 Huff	Location abandoned			
A. D. Morten et al's	9-21-5	8-19-20	2390	dry
Robinson Petroleum Co.'s	18-21-5	7-19-20	2390	280
Robinson Petroleum Co.'s No. 3	18-21-5	8-22-20	2384	200
Robinson Petroleum Co.'s No. 5	18-21-5	8-26-20	2400	280
Robinson Petroleum Co.'s No. 2	18-21-5	7-21-20	2398	203
Robinson Petroleum Co.'s No. 1	19-21-5	6-31-20	2400	dry
Inland Oil Co.'s No. 1	18-21-5	6-31-20	2307	dry
Pierce et al's No. 1 Huff	18-21-5	8-31-20	2403	dry
National Oil & Ref. Co.'s No. 1 Huff	19-21-5	7-21-20	2389	107
National Oil & Ref. Co.'s No. 2 Huff	19-21-5	7-1-20	2537	dry
Adams et al's No. 1	19-21-5	6-17-20	2570	dry

KANSAS COMPLETIONS

(Continued from Page 78.)

4-22-4, 150 bbls, 2478 ft; 8 Joliffe, west half 9-22-4, 50 bbls, 2458 ft.

Miami County

Bruner Petroleum Co.'s No. 10 Reinsch, northwest 14-13-25, 2 bbls.

C. B. & Q. Synd.'s No. 5 Marquis, northwest 10-19-24, 5 bbls.

Kansas Oil Co.'s No. 22 Dieh, southwest 10-19-24, 16 bbls.

Kansas & Gulf Oil Co.'s Nos. 8 Gilbert, northeast 35-17-21, 35 bbls; 9 Gilbert, northeast 35-17-21, 35 bbls.

Norma Oil & Gas Co.'s No. 11 Carey, northwest 1-18-21, 10 bbls.

Slater & Goudie's No. 6 Hiles, northeast 12-19-21, 35 bbls.

United Oil Co.'s No. 4 Dancaster, southeast 1-18-21, 30 bbls.

Montgomery County

J. P. Brady's No. 2 Ryan, southeast 1-34-13, 35 bbls, 548 ft.

O. O. Crane's No. 6 Grass, southeast 14-34-15, 15 bbls.

Jesse Graham et al's No. 7 Fair, southwest 17-35-17, 10 bbls.

Kanola Oil & Ref. Co.'s No. 10 Hamilton, southwest 10-35-15, 15 bbls.

Kansas-Okla. Cons. Oil Co.'s No. 21 Harding, northwest 4-35-15, 5 bbls.

Keystone United Oil & Gas Co.'s No. 13 Taylor, southwest 5-35-15, 40 bbls.

Standard Oil Co.'s No. 60 Moster, southwest 15-34-15, 8 bbls.

Sale Shows Faith of Operators in Deep Pay in Osage County

TULSA, OKLA., Oct. 19.—That the lime pay in the Osage reservation is one of the most attractive features of the later development of the wide range of pools in that territory is indicated in prices paid for acreage near wells that are producing from the lime formation, at the recent Government sale of Indian lands held at Pawhuska.

This development has been the outstanding feature of Osage County operations since Spring of this year, and it has been continually pointed out that the deeper drilling of wells in the western part of the Osage is profitable, especially where the lime has been picked up. The territory around Hominy, and to the west, both north and south, has come into the limelight because of the good production obtained from the lower formations.

During the course of the Osage sale, it was reported that the Gypsy had completed a new 4,000 barrel well from the lime in 35-23-7, and an offset 160 acres sold immediately thereafter for $271,000.

Acreage in townships 23-8 and 24-8 commanded high prices right along, because of the deeper pay already found in wells in those townships. Stuff to the south of Hominy also brought active bidding, and sales were made at relatively high figures.

Undoubtedly one of the two principal causes of the success of the sale was the fact that the lime wells drilled during the past few months have added new life to the Osage reservation. Another factor that contributed to the bidding was the fact that the 4800 acre rule was amended, allowing companies to acquire 6020 acres in the reservation, if bought from the auctioneer at a regular public sale.

H. V. Foster got a 600 barrel well in section 25-25-9 during the past week, along with several other smaller wells, and one 18,000,000 foot gasser. Indian Territory Illuminating Company got a 500 barrel well, completed and reported last week, in 36-23-10. These are two of the best recent completions in this part of the Osage.

The Prairie's wildcat test in 17-22-2w is not yet drilled in, waiting for the Champlin Refining Company to complete a line to it from Garber. It will likely be completed this week, and is expected to start a drilling campaign in this western section of Noble County.

East of Pawnee, the Pennhoma Oil Company has a well at 2586 feet that is making some gas, and not drilled into the sand. It is in 3-22-6. It is being watched with interest.

Large Companies Plan to Delay New Stephens County Wells

FORT WORTH, TEXAS, Oct. 20.—What the larger production companies in North Texas regard as one of the most important measures ever formulated for the conservation of crude oil in Central West Texas is under consideration by virtually all of the companies operating in Stephens County. At a meeting held in Breckenridge Monday night it was decided to institute a curtailment policy in bringing in new wells until such a time as storage was available to care for the crude oil. It is proposed to hold in all wells until November 1 except those which are offsets to producing leases.

A preliminary meeting was held in Breckenridge last Saturday night at which the question of curtailment was discussed but no definite action was taken. At both meetings it was pointed out that the average daily production of Stephens County now is above the 110,000 barrel mark and that the available pipe line capacity is considerably under this figure. It developed at the meeting Saturday night that the flush production of wells is not being handled adequately by pipe lines and that there is considerabl wastage.

The Oil and Gas Division of the Texas Railroad Commission, acting under authority of the conservation law, has served notice that if more wells are brought in in Stephens County until storage is available the Commission will order such new wells shut in. The Commission's notice in this case reads as follows:

"Whereas it has been brought to the attention of this commission that the capacity of the pipe lines serving Breckenridge field, amounting to 85,000 barrels per day has been reached, and that there is a large number of other wells in the said field nearing the sand and will likely be brought in before this condition can be relieved by the pipe lines, and lack of adequate storage in sight to adequately care for the excess production.

"It is ordered by the Railroad Commission of Texas that notice be and is hereby given to all interested parties, that in the event such a condition arises as now seems imminent, this commission will not hesitate to exercise the power vested in it to cause wells to be shut in even after they are completed, to stop any waste contrary to the law and the rules and regulations of this commission."

NORTH OKLAHOMA COMPLETIONS

Osage County

Ashland Oil Co.'s No. 8 Clem, southeast 14-23-11, 15 bbls.

Barnsdall Oil Corp.'s Nos. 1, northeast 34-26-9, abn; 1, southwest 19-25-10, 25 bbls; 9, northeast 3-24-11, 20 bbls.

Burk Pet. Co.'s No. 1, southwest 8-26-8, abn 2675 ft.

Beacon Oil Co.'s Nos. 1, northwest 4-25-11, 20 bbls after shot, 1783 ft; 7, northwest 25-25-11, 50 bbls after shot, 1709 ft.

Carter Oil Co.'s No. 1, southwest 9-26-26, abn 2909 ft; 1, northwest 9-26-6, 130 bbls, 2806 ft.

Connelly et al's No. 2, northeast 36-29-11, 10 bbls after shot 1046 ft.

Deep Pool Oil Co.'s No. 5, northwest 30-21-12, 25 bbls after shot, 1393 ft.

Delmar Oil Co.'s No. 5, southeast 35-25-9, 135 bbls.

Dallas-Osage Oil Co.'s No. 29, southeast 22-29-9, 15 bbls after shot, 1455 ft.

H. V. Foster's Nos. 2, northeast 25-25-9, 100 bbls; 7, northwest 25-25-9, 200 bbls; 6, northwest 25-25-9, 600 bbls; 35, northeast 33-22-10, 18,000,000 cu ft gas, 1535 ft.

59 Osage Oil Co.'s No. 10, southeast 7-24-11, 50 bbls.

Finance Oil Co.'s No. 1, northwest 27-27-10, 5,000,000 cu ft gas, 2275 ft.

F. A. Gillispie's No. 10, southeast 32-21-12, abn 1477 ft.

Grundish Oil Co.'s No. 2, northeast 3-25-8, 20 bbls, 2448 ft.

Gilliland et al's No. 1, northwest 35-26-8, abn 2735 ft.

Garnet Oil Co.'s Nos. 1, northwest 11-25-9, 20 bbls; 1, northwest 14-25-9, 15 bbls.

Gypsy Oil Co.'s No. 12, northwest 20-22-10, 50 bbls after shot, 1773 ft.

Guffey-Gillispie's No. 19, northwest 34-22-10, 20 bbls, 1825 ft.

Hivick et al's Nos. 3, northeast 8-24-11, 50 bbls after shot, 1650 ft; 4, in the same, 40 bbls after shot, 1705 ft.

Imperial Oil & Dev. Co.'s No. 33 McGarty, southeast 18-23-12, 10 bbls.

Indian Territory Ill. Co.'s No. 1, northeast 262-5-9, abn; 10, northeast 36-23-10, completed last week, making 500 bbls, 1749 ft.

Ideal Royalty Co.'s No. 12, southwest 20-21-12, 5 bbls.

Jennings et al's No. 3, northwest 36-29-11, 125 bbls after shot, 913 ft.

Kansoma Oil & Gas Co.'s Nos. 2, southeast 36 27-11, 50 bbls, 1400 ft; 3, southeast 36-27-11, 100 bbls, 1435 ft.

Kewanee Oil & Gas Co.'s Nos. 19, northeast 20-21-12, 20 bbls after shot, 1400 ft; 3, northwest 3-21-10, 10 bbls, 1870 ft.

Hugh King's No. 2, southwest 24-25-11, reported as gasser last week, making 1550 bbls after shot, 1632 ft.

Laurel Oil & Gas Co.'s No. 11, northeast 30 24-11, 40 bbls.

Marland Ref. Co.'s No. 9, northeast 18-27-8, 10 bbls.

Midland Oil Co.'s Nos. 23, southwest 28-22-10, abn 1882 ft; 9, northeast 19-22-11, 9,000,000 cu ft gas, 1555 ft.

Minona Oil Co.'s No. 4, southeast 23-22-10, 10 bbls, 1705 ft; 4, northeast 19-22-10, 18,000,000 cu ft gas, 1535 ft.

New England Oil Co.'s Nos. 17, southeast 5-24-10, 100 bbls; 18, southeast 5-24-10, 100 bbls.

Okla Prod. & Ref. Corp.'s No. 78, northeast 11-27-10, 90 bbls after shot, 1320 ft.

Osage Dev. Co.'s No 13, northeast 35-29-11, 100 bbls after shot, 900 ft.

Osage Ref. Co.'s No. 3, northeast 23-22-10, 20 bbls, 1760 ft.

Plover Drilling Co.'s No. 2, southeast 12-27-10, abn 2008 ft.

Pennant Oil & Gas So.'s No. 1, southeast 8-27-12, 10 bbls after shot, 1637 ft.

Prairie Oil & Gas Co.'s No. 10, southwest 17-29-9, 50 bbls after shot, 1600 ft.

Steyner Oil Co.'s Nos. 7, southwest 7-25-11, abn 1940 ft; 1, northeast 14-23-11, 30 bbls.

Summit Oil Co. et al's No. 7, northeast 20-26-11, 25 bbls, 1600 ft; 8, northeast 20-26-11, completed last week, making 500 bbls, 1599 ft.

W. B. Sanford Oil Co.'s No. 14, southeast 14-25-11, 85 bbls, 1785 ft.

Skelly Oil Co.'s No. 4, southwest 21-21-12, 100 bbls, 1377 ft.

Swsanson et al's No. 1, southeast 10-25-8, 35 bbls, 2315 ft.

Verland Oil & Gas Co.'s No. 1, northeast 17-21-12, 15 bbls, 1385 ft.

White Eagle Oil Co.'s No. 10, southeast 16-24-10, 30 bbls.

Yorkhoma Oil Corp.'s No. 6, northwest 20-26-11, 10 bbls, 1491 ft.

Kay County

Miller Oil Synd.'s No. 2 Hamer, southeast 17-25-3e, 5 bbls, 3419 ft.

OKLAHOMA OLD FIELDS COMPLETIONS

Creek County

Bristow Gas Co.'s No. 1 Smith, southwest 35-16-9, 8,000,000 cu ft gas 2540 ft.

Baker's No. 2 Jacobs, southeast 9-15-10, 75 bbls, 2705 ft.

Benmo Oil Co.'s No. 1, southwest 5-15-10, abn, 2737 ft.

Continental Pet. Co.'s No. 4 Jack, northwest 5-15-10, 300 bbls, 2755 ft.

Cosden Oil & Gas Co.'s No. 2 Vaughan, southeast 4-15-10, 100 bbls after shot, 2658 ft.

Dingwall et al's No. 3 Jacobs, southeast 0-15-10, 125 bbls after shot, 2697 ft.

A. L. Funk's No. 1 Lucey, northeast 23-16-11, abn 2339 ft.

Morrison & Jackson's No. 6 Golden, southwest 3-15-10, 50 bbls after shot, 2696 ft.

National Exploration Co.'s No. 1, northwest 21-17-10, 50 bbl showing, will shoot in the Glen sand.

Prairie Oil & Gas Co.'s Nos. 3 Roberts, southwest 8-16-9, 75 bbls, 2654 ft; 1 Martha, southeast 6-15-7, 500,000 cu ft gas, dr 2175 ft.

Phillips Pet. Co.'s No. 5 Miller, southwest 33-16-10, 50 bbls after shot, 2640 ft.

Pure Oil Co.'s No. 4 Walking, northeast 33-16-11, abn; 3 Perryman, northeast 25-19-7, 40 bbls after shot 2528 ft.

Sapulpa Pet. Co.'s No. 7 Bland, southwest 25-19-7, 29 bbls, 2700 ft.

Savoy Oil Co.'s No. 3 Smith, northeast 25-15-10, 200 bbls after shot, 3057 ft.

Skelly Oil Co.'s No. 4 Knight, northeast 15-15-10, 50 bbls, 2642 ft.

Dr. Scott et al's No. 1 McIntosh, northeast 5-15-10, 50 bbls, 2610 ft.

C. G. Tibbens' Nos. 4 Hood, northwest 4-17-12, abn 2365 ft; 9 Poloka, southwest 32-18-12, 5 bbls, 1600 ft.

Tyler County Bank's No. 11 Churchill, southeast 32-18-12, abn 1400 ft.

Texolean Oil Co.'s No. 3 Fixico, northwest 16-16-8, 25 bbls after shot, 3581 ft; 1 Washington, southwest 32-17-8, 10,000,000 cu ft gas, 2785 ft.

The Texas Co.'s No. 2 King, southwest 17-18-9, 5,000,000 cu ft gas, 2590 ft.

White Oil Corp.'s No. 4 Scott, northeast 23-15-10, 80 bbls, 3066 ft.

Payne County

Cosden Oil & Gas Co.'s No. 31 School Land, southwest 36-20-15, 10 bbls after shot, 3204 ft.

Josey Oil Co.'s No. 4 Busbee, southwest 35-19-5, 1500 ft oil in hole, 2468 ft.

Magnolia Pet. Co.'s No. 4 Walker, southeast 29-18-5, 200 bbls, 3302 ft.

Pure Oil Co.'s No. 1 Carter, southeast 2-18-5, 12 bbls.

Sinclair Oil & Gas Co.'s No. 4 Crockett, southwest 13-19-5, 20 bbls, 3175 ft.

Skelly Oil Co.'s No. 1 School Lands, southwest 16-19-5, 18 bbls after shot, 3252 ft.

Thompson's No. 2 Thompson, southwest 28-18-5, 10,000,000 cu ft gas, 3265 ft.

Nowata County

Banowitz et al's No. 1 Beck, southeast 36-28-14, abn 1160 ft.

Delott Oil Co.'s No. 2 Bevrage et al, northwest 31-27-16, 10 bbls.

Halman Oil Assn.'s No. 5 Denton, northwest 36-27-15, 20 bbls.

E. J. Lambert et al's No. 1 Fitsmanis, southeast 27-28-15, 10 bbls.

Old Fields in Oklahoma Show Consistent Development

Tulsa, Okla., Oct. 20.—Outside the prolific pools in eastern Creek County, the older fields of Oklahoma showed nothing during the past week of more than usual completions, the completions following a routine established some months ago, and holding the daily runs of these fields to a consistent high level.

Creek County, where much new development is under way, had a large number of wells completed, some of them being up to the standard for wells in that field. Continental Petroleum Company got a 300 barrel producer in 5-15-10, and Savoy Oil Company got a 200 barrel well after a shot, in section 25 of the same township. This territory has accounted for many good wells during the past three months, and has helped to swell the production for the state to the highest point it has been since the days of the Cushing field.

Texolean Oil Company has a 10,000,000 cubic feet gasser in southwest 32-17-8, east of Shamrock in Creek County, from the Tucker sand at 2795 feet.

Nowata County accounted for several wells during the week in review, all of them being small producers or abandonments. There is little significance attached to operations in Nowata and Washington Counties, aside from the added production which group of wells affords. The fields are proven, and new tests that are being drilled are usually on locations where it can be judged within a few barrels of what the well will make before it is drilled.

Payne County had one good well, that of the Magnolia's No. 4 Walker in 19-18-5, for 200 barrels at 3302 feet. Several smaller wells and gassers were completed.

Haymer Petroleum Company got a 160 barrel well in 6-17-13, south of Tulsa in Tulsa County, being the best thing completed in that county for the week.

D. C. Maxwell's No. 5 Zalmiser, southeast 17-28-15, 3 bbls, 1175 ft.

O. D. McCullam's No. 7 Brown, 10-25-16, 4 bbls.

Pushmataha Oil & Gas Co.'s No. 17 Currier & Co., northeast 7-25-17, 10 bbls.

Okla. Prod. & Ref. Co.'s No. 1 McCoy, southwest 2-27-14, 5 bbls

J. L. Smith's No. 3 Ross, northeast 36-27-15, 75 bbls.

L. G. Shields' No. 3 Mayfield, southeast 10-27-15, abn.

I. W. Taylor's No. 1 Rider, northeast 1-27-14, 20 bbls.

Frank Williams' No. 1 Cobbs, southwest 26-25-14, 25 bbls.

Tulsa County

Amber Oil Co.'s No. 2 Ricketts, northeast 6-17-13, abn 1832 ft.

Creo Oil Co.'s No. 9, 1-21-12, 15 bbls.

Haymer Pet. Co.'s No. 1 Bemore, northeast 18-19-10, 160 bbls with gas, 2040 ft.

Jitney Oil Co.'s No. 1 Beck, 34-21-14, 15 bbls.

Dekoma Dev. Co.'s No. 1 Doyle, southwest 16-19-10, 10 bbls, 2132 ft.

Progressing Oil & Gas Co.'s No. 1 Young, southeast 4-20-13, 3 bbls.

Wiser Oil Co.'s No. 2 Mesbet, southwest 31-18-13, 12 bbls, 1823 ft.

Washington County

Barnsdall Oil Co.'s No. 16 Brent, southeast 1-26-13, 30 bbls, 460 ft.

Cobleigh et al's No. 4 Curnatzer, southwest 1-26-13, abn 460 ft.

W. L. Cusenbery et al's No. 1 Kornegay, southeast 31-29-14, abn.

Johnson Oil & Ref. Co.'s No. 4 Wilkerson, northwest 21-26-14, 10 bbls, 568 ft.

Progressive Oil Co.'s No. 1 Sullivan, northeast 23-29-13, 5 bbls, 1242 ft.

Humble Oil Gets Big Gas Well Near Healdton

Tulsa, Okla., Oct. 19.—Humble Oil & Refining Company et al's No. 3 Williams in northeast 34-2 S-3 W got a gas flow estimated at 40,000,000 cubic feet at 2188 feet while drilling out a plug this week, and the well has been connected up to the Lone Star Gas Company line.

In section 27 of the same township the Plains Oil & Gas Company got a 15,000,000 foot gasser at 1850 feet on the Williams lease.

Grant et al have a wildcat test five miles west of Duncan in section 32-1 N-8 W that got a sand at 1335 feet and is showing some gas. It is 15 feet in the sand.

In the Hewitt pool there was a falling off in the number of wells completed during the past week, though several good producers were added. Carter Oil Company again took the lead in new production with Magnolia Petroleum Company and The Texas Company both getting good wells.

Jake Hamon got a 200 barrel producer in Cotton County in 32-1 S-10 W, this being the only big well completed in this field for the week.

Only small wells and abandoned were reported from Stephens County.

The fields of the south end of the state, especially the proven pools are yielding to the pressure of financial conditions and curtailed opinions and efforts to extend the pools are not being pushed as vigorously as in the early spring of this year. A consistent line of production is regularly added from the Hewitt, Duncan and Empire pools, and wildcat tests are bidding time in most sections.

SOUTH OKLAHOMA COMPLETIONS

Carter County

Carter Oil Co.'s Nos. 10 Woodruff, 15-4 S-2 W, 150 bbls, 1680 ft; 4 Mullen, 16-4 S-2 W, 250 bbls, 1450 ft; 5 Mullen, same section, 200 bbls, 1520 ft; 8 Ward, same section, 300 bbls, 2054 ft; 3 Ward, 21-4 S-2 W, 200 bbls, 2365 ft.

Humble Oil & Ref. Co.'s No. 2 Lowery, 21-4 S-2 W, 150 bbls, 2375 ft.

Magnolia Pet. Co.'s Nos. 3 Cruce, 16-4 S-2 W, 150 bbls 1444 ft; 1 Griffin, 26-4 S-2 W, 300 bbls, 2260 ft.

Texas Co.'s Nos. 3 Ward, 21-4 S-2 W, 300 bbls, 2195 ft; 3 Westheimer, 27-4 S-2 W, 200 bbls, 2350 ft.

Wolverine Oil Co.'s Nos. 26 Dillard, 22-4 S-2 W, 150 bbls, 1228 ft; 17 Westheimer, 22-4 S-2 W, 50 bbls, 1480 ft.

Cotton County

Hamon's No. 5 Fink, 32-1 S-10 W, 200 bbls with 2,000,000 cubic ft gas 2130 ft.

Prairie Oil & Gas Co.'s No. 9 Howell, 5-2 S-10 W, 15 bbls, 2125 ft.

Priddy & Green's No. 1 Green, 8-2 S-10 W, abn, 2680 ft.

Stephens County

Lone Star Qas Co.'s Nos. 1 Emmons, 22-1 S-5 W, 5 bbls, 450 ft; 9 Killingsworth, 1-1 S-5 W, 8 bbls, 620 ft.

Magnolia Pet. Co.'s No. 4 Robertson, 1-2 S-5 W, 5 bbls, 428 ft.

Midget Oil Co.'s No. 5 Dickson, 1-2 S-5 W, abn, 985 ft.

Majestic Oil Co.'s No. 2 Mitchell, 14-2 S-5 W, 3,000,000 cu ft gas, 440 ft.

Those Seeking Work in Mexico Should Stay Home

Houston, Texas, Oct. 19.—A representative of one of the larger oil companies operating in Mexico stated this week that those who are seeking work in the Mexican oil fields should be warned to stay away from Tampico. That city is already filled to overflowing with men from the states seeking work and there are several men to every oil field job open. Most of the larger companies select men in the states for the jobs before they are open and the men are sent to Mexico. Those on the ground have little opportunity of getting work. The cost of living is high in Tampico and hotel accommodations are scarce.

PULLS FOURTH SEA LINE

Tampico, Tamps, Oct. 21.—The Texas Company of Mexico has successfully pulled its fourth sea line, setting a new time record of one hour for completing the operation. The line was pulled by the S. S. Shenandoah. The line connects with the company's terminal at Agua Dulce and is the fourth berth owned by the terminal and is the second time it has been pulled within the past month.

1500 BARREL WELL

Tampico, Tamps., Oct. 21.—The Mexican Gulf Company has completed No. 4 Zuniga at Panuco for 1500 barrels at 1980 feet in shale.

Federal Quarantine Against Tampico Costly Without Need

HOUSTON, TEXAS, Oct. 19.—The federal quarantine against Tampico, Mexico, on account of the yellow fever scare, is working an unjust hardship on the larger oil companies plying tankers between Tampico and Gulf points, and is proving rather costly in loss of time and money. There is no yellow fever in Tampico and has not been for some time. At one time there were two cases, one of which has recovered and the other died.

The quarantine regulations require that a vessel must have been away from Tampico for at least six days before it is permitted to dock. The trip between Galveston and Tampico requires but two days and as a result the vessel must lie outside quarantine four days. One large company stated this week that the unnecessary regulations had already cost it $200,000 and it is estimated that all oil companies so affected have lost probably $1,000,000 through the unjust regulations applying to Tampico.

It is stated that there was yellow fever in the lower country around Tuxpam where 33 cases were reported, of which 24 died and the rest are receiving treatment. No new cases have been reported at Tuxpam since October 8.

MEXICAN DRILLING REPORT

Southern Fields

Union Oil Co.'s Nos. 9 lot 114 Chinampa, cementing 10 inch; lot 208 Amatlan, dr 925 ft in shale.

Cia Mexicana de Potroleo "El Aguila," S. A., No. 11 Los Naranjos, suspended, 2835 ft, hard blue shale; No. 13 drilling 2165 ft, shale; 15 drilling 1850 ft, brown shale; 16, cleaning out, 860, grey shale; no report on Nos. 17 or 18.

Mexican-Sinclair Co.'s Nos. 127 Amatlan, running 10 inch, 810 ft; 2 lot 251, dr 1855, brown shale; 3 lot 251, dr 1940 ft, blue shale. (Completed.)

Freeport Mexican Fuel Co.'s No. 1 San Isdiro, dr 280 ft; no report on No. 2 San Isidro.

Mexican Gulf Co.'s Nos. 1 lot 148 Amatlan, testing casing; 4 lot 251, rigging standard.

International Oil Co.'s Nos. 2 lot 252 Amatlan, bridged 70 ft off bottom; 10 lot 252 Amatlan, dk; 5 lot 217, dr 2170 blue shale; 9 lot 231, waiting on permit; 8 lot 222, waiting on crew.

The Mexican Texas Co.'s No. 1 lot 183 Amatlan, dr 1765 ft, shale.

Empire Gas & Fuel Co.'s Nos. 2 lot 114 Chinampa, dr 650 ft, shale; 3 lot 114 Chinampa, rigging up.

E. J. Nocklos' No. 7, lot 114 Chinampa, dr 800 ft shale.

Island Oil & Transport Co.'s No. 1 lot 252 Amatlan, dr 2000 ft, shale; 4 lot 114 Chinampa, under-reaming for 12½ inch, 850 ft shale; lot 135 No. 2 Chinampa, rig up; No. 2 lot 96 Chinampa, pulling casing.

Crew on all Transcontinental wells trying to close well running wild.

MEXICAN SINCLAIR
PETROLEUM
CORPORATION
120 Broadway, New York

FUEL OIL

Say you saw it in THE OIL WEEKLY

Previous Export Records for Mexico Broken in September

TAMPICO, TAMPS., Oct. 21.—All previous petroleum exportation records were broken in September when 17,311,217 barrels of petroleum and petroleum products were exported from Mexican ports, thereby breaking the former high record set in August by nearly two million barrels. At the present rate of exportation experts claim that Mexican exports will pass the 200,000,000 barrel mark, which marks an interesting growth in the petroleum industry of that country when it is known that the total production of Mexican oil fields in 1919 was approximately 80,000,000 barrels and the production of the United States approximately 376,000,000 barrels. At the present rate the United States will produce about 280,000,000 barrels or a growth of less than 20,000,000 barrels in one year in that country against a growth of more than 120,000,00 barrels in Mexico in one year.

There has been a steady increase in exports since the first of the year with the greatest strides taken in the last three months. During September virtually all of the nineteen shipping companies showed an increase over the records of August and in some cases the figures were almost doubled.

The export figures by months since the first of the year and the exports by companies in September, are as follows:

Monthly Oil Exports

January	8,061,289.67
February	7,687,943.83
March	10,288,383.92
April	10,092,312.90
May	11,255,531.93
June	10,574,396.64
July	12,275,021.21
August	15,438,008.38
September	17,311,217.65
Total	102,985,106.13

September Exports

Huasteca	2,695,191.89
Aguila	2,248,387.00
Transcontinental	1,991,866.08
Mexican Gulf	1,492,188.02
Island	1,377,334.74
Cortez-Atlantica	1,344,230.00
Texas	1,058,675.90
Cias. del Agwi	1,024,757.78
Penn Mex	898,154.80
Freeport	783,580.81
East Coast	622,164.97
Corona	473,795.63
Cochrane & Harper	372,664.31
National Oil	232,966.23
Tal Vez	176,942.68
National Petroleum	147,875.63
New England	134,018.69
Interocean	69,088.75
Pierce Navigation	67,333.74
Total	17,311,217.65

SHOWING SALT WATER

Tampico, Tamps, Oct. 21.—The East Coast Oil Co.'s No. 414 Panuco is showing 90 per cent salt water. This well was completed for 20,000 barrels on July 20, 1919, and has been flowing a maximum of 12,000 barrels until it showed about 10 per cent salt water September 15 of this year. The hole will probably be plugged.

Mexican Wildcats

Lower Amatlan

Union Oil Co.'s No. 1 lot 208 Amatlan, dr 900 ft, shale.

International Pet. Co.'s Nos. 5 southwest corner lot 217 Amatlan, dr 2165 ft, blue shale; 9 northwest corner lot 231 Amatlan, north of Laja River and northwest of new Zacamixtle producer, waiting on permit; 8 lot 222, north of Laja river, waiting on crew.

Huasteca Pet. Co.'s No. 3 lot 218 Amatlan, north of Zacamixtle, across Laja river, dr 1210 ft in blue shale; 2 lot 222, adjoining north of Laja river, dr 2050 ft in blue shale. (Nearing interesting depth, may be off trend and too far east.)

Zacamixtle

(Huasteca Pet. Co.'s well on lot 24 was completed last week and reported. Further report in this issue. Most important completion in Mexico.)

Union Oil Co.'s No. 1 lot 63 Zacamixtle, northeast of new completion, dr 900 feet in shale.

"El Aguilla" Co. (No report on three wells.)

Mexican Gulf Co.'s No. 2 Zacamixtle, shut down for casing line at 1820 ft.

Corona Pet. Co.'s No. Z-1, setting 10-inch, 1700 ft; Z-2 ready to start; Z-3, derrick.

Huasteca Pet. Co.'s No. 2 lot 101, drilling 1077 ft in basalt, carrying 12½ inch, in northeast corner of district, southeast of lot 222 Amatlan, across Laja river.

Toteco District

Mexican Gulf Co.'s No. 1, southeast corner of Toteco near Huasteca Pet. Co.'s railroad, west of southwest extremity of Zacamixtle, just north of Cerro Azul district, drilling 1443 feet in shale.

International Pet. Co.'s No. 1 Toteco, near Mexican Gulf well, rigging standard.

CHINESE COOK WAS ON JOB

Houston, Texas, Oct. 21.—A Chinese cook was instrumental in saving the Aguila Oil Company several thousands of dollars during the fire at the company's tanks in Tampico, Mexico, two weeks ago, when regardless of his life, he mounted a blazing gasoline tank with a fire extinguisher while other workmen were rushing from the scene in fear of an explosion.

During the fire, which destroyed one 55,000 barrel tank and resulted in the death of two men as well as the injury of about 75 others, a gasoline tank was discovered with roof ablaze. This tank was filled with oil although it was believed that it contained gasoline. When the fire was discovered all workingmen ran from the scene in fear of an explosion. The Chinaman, however, walked calmly to a ladder, obtained this and a fire extinguisher and climbed to the top of the tank while it was blazing and bubbling over. By use of the extinguisher he succeeded in putting out the blaze.

USING FUEL OIL IN ARGENTINA

Washington, D. C., Oct. 18.—British railway companies in Argentina have turned to petroleum as fuel for their engines, according to reports to the Department of Commerce. The Compania Argentina de Comodoro Rivadavia has entered into contracts with three British railway companies for a 20-year usufruct, which will afford the roads sufficient petroleum to all them to dispense entirely with the use of wood as fuel.

Robert T. Hill, geologist of Dallas and Los Angeles, is in his office aften ten days spent at his home in Dallas following an automobile accident two weeks ago when he suffered painful bruises.

Permanent Results from I. O. M. A. Convention

Chicago, Oct. 18.—Theodore F. Kuper, whose address on the standardization of tests at the I. O. M. A. convention aroused keen interest, believes the convention accomplished some pronounced good for the industry.

"First," he says, "it provided an opportunity for the Pacific Coast oil men to meet the Eastern faction, and brought about a sympathetic understanding between East and West which has long been needed. California and the East have long been at loggerheads over the matter of freight rates, for example. It took us only a few minutes in committee, however, to get together and agree on a resolution."

Referring to the matter of standardization of tests, rules and code of practice, Mr. Kuper thinks there is no question that before long the entire industry will have come together and adopted standard, uniform rules.

"One encouraging aspect of the meeting," he said, "was the sentiment that is crystallizing against the 'parade idea.' Many of the men I talked to feel strongly that the I. O. M. A. convention should be more in the nature of heart-to-heart conferences on the industry's problems, and that any features which operate to defeat their serious purpose should be eliminated."

Mr. Kuper believes that Houston would be a capital convention city for 1921, offering somewhat the same advantages as did Denver, in that it is not too far East for the Westerners. "If the next convention can again bring oil men together from the entire country," he said, "and its organizers will not hesitate to make it serious-minded—a strictly business men's convention—it will with hardly a question score the greatest success of any oil men's convention ever held. The oil industry has been 'jest growing,' like Topsy, to date, but now it is beginning to reach maturity and to have real problems. The executives of the industry, from the Atlantic to the Pacific, are fully awake to this fact, and feel the need of conventions and the necessity of making the conventions get at the heart of their problems. There is an opportunity for the organizers of the next convention to perform a great service for the industry."

JAP COMPANY TO OPERATE IN MEXICO

Washington, D. C. Oct. 18.—Advices from Mexico City report that a Japanese Company with a capital of fifty million yen ($25,000,000) has been organized with the intention of entering upon the exploitation of any petroleum deposits that may be discovered upon the west coast of Mexico. A commission of geologists is investigating the matter and it is reported that numerous springs of chapopote or liquid asphaltum have been discovered in the district between Mazatlan and Rosario, in the state of Sinaloa.

MEXICAN BANK TO HELP OIL MEN

Washington, D. C., Oct. 18.—Steps are reported to be under way in Mexico for the organization of a Bank of Petroleum for the purpose primarily of aiding the oil companies which are hampered by lack of banking facilities in the country. It is said that the new bank will commence with a capital of $1,000,000, which will be increased as the demand grows. It is reported that ex-Secretary of the Treasury McAdoo is one of the leaders in the enterprise.

The Texas Company's 50-piece band from Houston gave State Fair visitors a real treat Friday and Saturday of last week when it paraded through the principal business thoroughfares in Dallas. The Texas Company Band led the parade of Traveling Men in Dallas last Saturday.

WEST COLUMBIA PRODUCTION

The average daily production for the West Columbia field during the past week was distributed approximately as follows:

	Barrels
The Texas Company	11,000
Humble Oil & Refining Company	24,300
Gulf Production Company	4,500
Sun Company	100
Crown Oil & Refining Company	250
Southern Petroleum Company	125
Monarch-Stribbling	800
Total	41,075
Last week	40,425

PRODUCTION OF NEW POOL

The Texas Company's No. 1 Abrams, first well to be brought in in the north extension of West Columbia, is still flowing through drill stem at the rate of more than 7000 barrels a day. The other wells recently completed north of the Abrams have not been holding up at the same rate of The Texas Company's gusher. The Monarch-Stribbling Co.'s No. 1 Smith et al, the second well to be brought in, made about 50 per cent water the latter part of last week. It sanded up early this week, and it was decided to plug off the open hole. When this well was first completed strainer was set. In an attempt to increase production it was drilled deeper and produced through strainer and open hole. It then made a quantity of water, believed to be coming through open hole.

The Humble Oil & Refining Company No. 1 Robinson, the second well to be completed in the new pool, with an initial production of about 1200 barrels which soon increased to between 8000 and 10,000 barrels, averaged approximately 7500 barrels, 12 per cent b. s. and 2 per cent water, during the past week. This company's No. 2 Robinson, completed last week for the fourth producer in the new pool, is now making about 930 barrels, 1 per cent water. The Gulf Production Company's No. 1 Mary C. Masterson, the third well to be brought in, after considerably difficulty, averaged about 2200 barrels, 12 per cent b. s. and 2 per cent water, during the past week. This well came in through perforated casing, and flowed at the rate of 10,000 barrels for five hours, at which time it sanded up. Screen was then set, and after bailing it came in for 4000 barrels of net oil.

The Humble Oil & Refining Company's No. 28 Japhet, completed about three weeks ago for an eastern extension of the old pool, is now flowing about 9500 barrels of net oil.

WEST COLUMBIA DRILLING REPORT

Humble Oil & Ref. Co.'s Nos. 27 Japhet, dr 2750 ft; 26 Japhet, dr deeper 3560 ft; 2 Ty-Wy, dr 3175 ft; 1 Goldman, dr 950 ft; 2 Goldman, dr 700 ft; 3 Goldman, dr 100 ft; 1 Munson, lcn; 3 Robinson, dr 575 ft.

Southern Pet. & Ref. Co.'s No. 3 Hogg, dr 2400 ft.

Crown Oil & Ref. Co.'s Nos. 1 Munson, dr 2050 ft; 3 Olchewske, dr 2900 ft.

Great Belt Oil Co.'s Nos. 2 Hogg, pulled 4½-inch liner to dr deeper; 3 Hyde, dk.

Simms Oil Co.'s No. 1 Turner, 3300 ft.

Barkley & Meadows-Kansas & Gulf Oil Co.'s No. 1 Smith, set screen 3400 ft, came in flowing oil and fresh water. This test was closely watched during the latter part of the week, as the fresh water is unaccounted for. This well is farther north than any of the late completions in the new pool, and will mean a further extension if completed. Wire reports later in the week said that liner had been set on seal to cut off water, and that the well was bailing.

United Dr. & Dev. Co.'s No. 1 Hogg, preparing to bail, 2160 ft.

National Pet. Co.'s No. 1 Ehman, rigging up to deepen.

General Oil Co.'s No. 2 Rich, dr 2630 ft in gumbo, showing gas. This well is farther north than any drilling well near the new pool, and the occurrence of gas at the shallow depth of the well is unaccounted for unless through a stray shallow sand, as the dip in the formation should set producing depth below 3800 feet if the dip in the formation continues.

Mercer & Masso's No. 1 Rich, dr 600 ft, new pool.

Monarch-Stribbling Co.'s Nos. 2 Smith et al, dr 600 ft; 3 Smith et al, dr 475 ft, new pool.

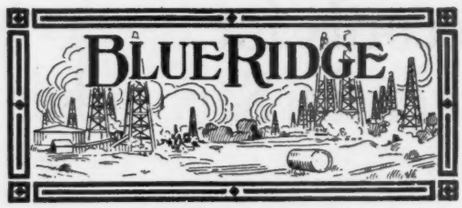
White Oil Corp.'s No. 1 Phillips-Bordages, dk, waiting on rig. This is a new location in the new pool, and lies north of the Jackson 50 acre dip into the Abrams tract, 50 feet east and 50 feet north of southwest corner of eastern half of Phillips & Bordages' 233.8 acre fee.

The Texas Co.'s Nos. 39 Hogg, fsh 3350 ft; 46 Hogg, on beam, 3700 ft; 49 Hogg, dr 2690 ft in hard sand (this well offsets No. 1 Abrams); 50 Hogg (new pool), lcn; 51 Hogg (new pool), dr 2280 ft; 52 and 53 Hogg, rigs up; 2 Abrams, dr 2760 ft; 3 Abrams, dr 2570 ft; 4 Abrams, dr 1860 ft.

Gulf Prod. Co.'s Nos. 3 W. C. Hogg, running core barrel, 3588 to 3600 ft, hard sand; 4 W. C. Hogg, dr 2675 ft; 2 H. Masterson, dr 2275 ft; 2 Mary C. Masterson (new pool), rig up; 3 Mary C. Masterson (new pool), rig up; 1 Beatty (new pool), rigging.

Gulf Coast Oil Corp.'s No. 1 Smith (new pool), spudded in.

National Pet. Co.'s No. 1 Williamson, sd 2578 ft.



BLUE RIDGE PRODUCTION

The average daily production for the Blue Ridge field during the past week was approximately 1000 barrels.

NEW WELL FALLS OFF

Gulf Production Company's No. C-3 Bassett Blakely, recently brought in at Blue Ridge for 1400 barrels, has fallen to 800 barrels, but is showing no b. s. or water. The well has held steady around 800 barrels during the past week. Some new locations are now being made by several companies.

BLUE RIDGE DRILLING REPORT

West Prod. Co.'s No. 1 Luscher, dr 3150 ft.

West-Gulf.'s No. 3 Luscher 500 Acres, dr 300 ft.

Blue Ridge Prod. Co.'s No. 1 Bassett Blakely, dr 1375 ft.

The Texas Co.'s No. 1 Robinson, around 3400 ft with small show.

Gulf Prod. Co.'s No. 1 Bassett Blakely, set screen 2650 ft.

L. B. Elliott of the Crude Oil Marketing Company at Wichita Falls was in Tulsa this week warming hands with his many friends.

SOMERSET PRODUCTION

The average daily production in the Somerset field for the past week was approximately 1100 barrels.

SOMERSET DRILLING REPORT

Arkmo Oil Co.'s No. 1 Rambie, dr 800 ft.

Bexata Oil Co.'s Nos. 1 Mary Williams, dr 940 ft; 4 J. T. Williams, dk.

Cloverleaf Oil Co.'s Nos. 1 N. G. Rambie, dr 850 ft. in gumbo; 2 N. G. Rambie, dk; 3 and 4 Rambie, lcn.

Frontier Oil Co.'s Nos. 10, Boynton; 11 Boynton, spudded in; 12 Boynton, lcn.

Grayburg Oil Co.'s Nos. 11 Carruthers, dr 12 and 13, rigging up; 14 dr 1250 ft; 4 Texas Carruthers, dr 1200 ft; 5 rigging up; 1 Ila Carruthers, cemented at 1350 ft; 2 Schmidt, dk.

Geologist Syndicate's No. 1 north of Devil's river lease, standing 400 ft.

Helvetia Copper Co.'s Nos. 6 Klemke, dr 350 ft; 10 Smith, rigging up.

The Jackson Co.'s Nos. 2 Seffell, dr 900 ft; 3 dk.

Lain Oil Co.'s No. 6 Kurz, dr 700 ft.

La Salle Oil Co.'s No. 3 Avent, dr 1200 ft.

Medina Oil & Dev. Co.'s Nos. 1 Barker, on pump, reported making 8 barrels; 2 spudded in.

McClure et al's Nos. 3 Carruthers, dr; 4, dk.

Marathon Oil Co.'s Nos. 3 Brown, cemented to cut off water; 4, dr 240 ft; 4 Schmidt, cemented to cut off water; 5, dr 350 ft.

Mountain Iron Oil Co.'s Nos. 2 Crenshaw, dr.

National Producing & Ref. Co.'s No. 1 Easteily, dr.

Ozark Oil Co.'s Nos. 6 Eve, bailing; 7, dk.

Somerset-Mission Oil Co.'s No. 1 Carruthers, dk.

Southex Dev. Co.'s Nos. 2 Stevens, dk; 1 Winans, lcn.

Texas Buffalo Oil Co.'s Nos. 8 Pyron, dr 1100 ft; 10 and 11, dks.

Witherspoon Oil Co.'s Nos. 6 Texas Carruthers, cemented; 9 La Grange, dr in; 4 Ila Carruthers dr 600 ft; 5 lcn.

MISSION DRILLING REPORT

Somerset-Mission Oil Co.'s No. 1 Wright, shut down at 320 ft.

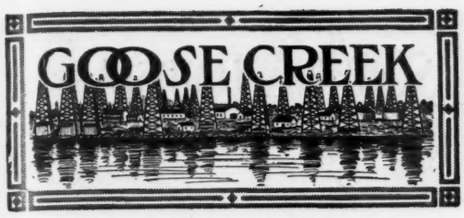
SOUTH MEDINA DRILLING REPORT

Arizona Oil Synd.'s No. 1 Peace, sd.

State Standard Oil Ass'n's No. 1 Hendrickson, near Medina river, sd.

A newcomer to the New York curb market is Old Dominion Petroleum Corporation, the shares of which have advanced in price to 2 and 2⅛ after initial quotations at 1½ and 2⅝. Old Dominion Petroleum Corporation has producing wells in the Burkburnett and Electra fields of North Texas, and holds acreage in the new Kemp-Munger-Allen field. It also has tracts on the north border of the Red River in Oklahoma, near wells completed by the Testerman and other interests. The company has an authorized capitalization of $1,500,000 (par value of shares $1), of which $900,000 is outstanding.

H. M. Edinger of the Cosden Company has been elected comptroller of the Bigheart Producing & Refining Company. Wm. L. Noell, auditor of the Bigheart Company, has resigned to become auditor of the Bay State Refining Company.



GOOSE CREEK PRODUCTION

The average daily production for the Goose Creek field during the past week was distributed approximately as follows:

	Barrels
Gulf Production Company	6,100
Humble Oil & Refining Company	3,950
Crown Oil & Refining Company	1,175
Gulf Coast Oil Company	1,100
E. F. Simms & Company	2,700
Sun Company	700
Turnbow Oil Company	275
Goose Creek Oil Corporation	600
Miscellaneous	275
Total	16,875
Last week	16,100

GOOSE CREEK COMPLETION

Gulf Prod. Co.'s No. 6 Briggs, workover, flowing 700 bbls, 1800 ft.

GOOSE CREEK DRILLING REPORT

Gulf Coast-Crown Co.'s Nos. 21 Gaillard 21 Acres, workover, dr 2675 ft; 22 Gaillard, dr 2980 ft; 23 Gaillard, dr 3175 ft; 31 Gaillard, dr 3380 ft; 32 Gaillard, dk; 33 Gaillard, dr 3240 ft.

Cinco Oil Co.'s No. 3 K. Mitchell, workover, set screen 2100 ft, testing.

E. F. Simms & Co.'s No. 13 Sweet, blew out last week and wrecked derrick, now milling at 1775 ft; 19 Sweet, set screen 2680 ft, standard rig; 21 Sweet, dr 3200 ft; 26 Schilling, dr 2200 ft; 27 Schilling, dr 3130 ft; 28 Schilling, dr 1200 ft; 39 Ashbel Smith, milling 2100 ft; 41 Ashbel Smith, dr 2100 ft; 3 Duke, dr 2990 ft.

Sutherland Oil Co.'s No. 2 Midfield Scott, dr deeper.

Oil & Gas Co.'s No. 1 Fitzgerald, dr 1910 ft.

Texas Washington's No. 2 Bryan, sidetracking 2000 ft.

Sun Co.'s Nos. 1 M. & H., shot 6-inch at 1600 ft, dr 1770 ft; 8 Hoffman, standing rigged up.

Majestic Oil Co.'s No. 1 Dolan, fsh.

Humble Oil & Ref. Co.'s Nos. 3 Humble-Isenhour, wash over screen to pull, 1900 ft; 4 Dannenbaum, milling 2240 ft; 43 Gaillard 25 Acres, fsh for 38 ft 8-inch, 1920 ft; 9 Gaillard 5 Acres, dr 3375 ft; 33 Gaillard 25 Acres, dr 3000 ft; 22 Gaillard 25 Acres, milling 2770 ft; 23 Gaillard Penn, dr 800 ft; 7 Jones Stateland, workover, fluid 100 ft from top, 400 ft oil on top salt water, t. d. 2800 ft; 11 Jones Stateland, dk; 10 Jones Stateland, standard rig, 3300 ft; 10 Texas-Isenhour, waiting on standard rig 2335 ft.

International Oil Co.'s No. 1, rig up.

Gulf Prod. Co.'s Nos. 27 Stateland, tested sw 2900 ft; 28 Stateland, building standard rig, 3300 ft; 29 Stateland, dr 2775 ft; 30 Stateland, lcn; 23 Beaumont, dr 3350 ft; 24 Beaumont, dr 800 ft; 11 C. Gaillard "A," dr 3950 ft, deep test in center of production, showing reported; 15 Tabb "A," set screen 2350 ft; 14 Busch, dk; 13 John Gaillard, testing 1550 ft; 17 H. Gaillard, dr 2475 ft; 20 H. Gaillard, dr 2575 ft; 3 Hoffman Gaillard "A," dr 2575 ft; 13 Busch, dr 2100 ft; 5 Wright "A," dr 2100 ft; 2 Rosenthal Stateland, dr 2775 ft.

Goose Creek Oil Corp.'s No. 5 Freeman 19 Acres, dr 1200 ft.

J. A. Rees, head of the leasing and scouting department of The Texas Company at Cisco, Texas, returned last Wednesday from a business trip to New York City. Mr. Rees also visited Hartford, Conn., and Louisville, Ky.

SARATOGA PRODUCTION

The average daily production for the Saratoga field during the past week was approximately 3800 barels.

SARATOGA COMPLETIONS

Gulf Prod. Co.'s No. 38 Hoskins Fee, pumping 100 bbls, 900 ft.

San Bernard Oil Co.'s No. 8 Off-set, pumping 30 bbls, 1160 ft.

SARATOGA DRILLING REPORT

Sun Co.'s Nos. 160 U. P., set screen, 1140 ft; 158 U. P. dr 600 ft; 161 Sante Fe, dk.

Weldon Oil Co.'s Nos. 13 Hooks, dr 975 ft; 1 Tiedman, dr 650 ft; 3 Brice Acre, dr 400 ft.

Rio Bravo Oil Co.'s No. 36, dr 675 ft.

Paggi Bros.' No. 1 Houk, dr 800 ft.

Bradley Oil Co.'s No. 1 Elise, dr 750 ft; 2 Elise, dk.

Gulf Prod. Co.'s Nos. 37 Hopkins Fee, dr 800 ft; 39 Hopkins, dr 400 ft; 40 Hopkins, dk.

DAMON MOUND PRODUCTION

The average daily production for the Damon Mound field during the past week was approximately 6500 barrels.

DAMON MOUND DRILLING REPORT

Sinclair Co.'s Nos. 17 Bryan, dr 850 ft; 10 Masterson, dr 2700 ft; 1 Munson, dr 2875 ft; 18 Bryan, dr 1650 ft; 19 Bryan, rig.

Humble Oil & Ref. Co.'s Nos. 1 Mock, dr 3160 ft, broken lime; Gallagher, dr 1500 ft.

Charles H. Baker of New York has been visiting with S. M. Griswold, president of the Griswold Oil Company at Wichita Falls. He is a stockholder in the company and inspected leases at Iowa Park.

SOUR LAKE PRODUCTION

The average daily production for the Sour Lake field during the past week was distributed approximately as follows:

	Barrels
Gulf Production Company	1400
The Texas Company	1850
Humble Oil & Refining Company	500
Yount-Lee Oil Company	250
Lake Oil Company	375
Theis Oil Company	100
Farish & Ireland	85
Gilbert Oil Company	70
Miscellaneous	760
Total	5390
Last week	5380

SOUR LAKE DRILLING REPORT

The Texas Co.'s No. 297 Fee, dr 2200 ft.

Gulf Prod. Co.'s Nos. 35 Tarver Hardin, side-tracking; 49 Tarver Hardin, dk.

Cromwell Oil Co.'s No. 2 Jackson, sd 2940 ft. (Will be dropped until operations are resumed.)

Conroe Oil Co.'s No. 5 Wash Brown, dk. (Will be dropped until drilling is started.)

BARBERS HILL PRODUCTION

The average daily production for the Barbers Hill field during the past week was approximately 500 barrels.

BARBERS HILL DRILLING REPORT

Walter Keeble's No. 1 Ben Fisher, dr for cap rock.

United Pet. Co.'s No. 5 Richardson 15 Acres; spudded in.

G. E. Smith et al's No. 1 Richardson 10 Acres, dr 2200 ft.

Crown Oil & Ref. Co.-Gulf Coast Co.'s No. 1 Fisher, dr 850 ft.

Wells Making 800 and 1200 Barrels Completed at Vinton

HOUSTON, TEXAS, Oct. 20.—The completion of a 1500 barrel workover well some distance west of the main field at Vinton, La., and the completion of a 1200 barrel well in the main Vinton pool were the principle features in coastal Louisiana during the past week with particular attention centered on the well west of the main pool.

The work-over well, Marrs McLean's No. 1 Gray, formerly owned by the Gulf Refining Company, came in October 9, flowing by heads at the rate of 1500 barrels at 1800 feet and later in the week settled down to a steady flow of 800 barrels a day. This well made a small producer when completed by the Gulf Refining Company but, when this company concentrated its operations within the main pool, it changed hands and was drilled deeper. There are no other producers in the immediate vicinity of the well, although a number of wells, most of which were failures, were drilled north, west and south of it.

Two wells were drilled in the center of Gray Lake, which is immediately south of the No. 1 Gray. Although it is not considered a new extension and its sand is believed to be an extension of one in the old pool, its rate of production has caused considerable interest. Few producers of similar size have been brought in in that field in recent years and the production of these did not hold up well. Marrs McLean's No. 1 Gray is showing no b. s. or water and after dropping to a steady flow of 800 barrels a day, remained stationary.

The other completion of note was the Gulf Refining Company's No. 21 Star Vincent which was completed at 2100 feet with an initial production of 1200 barrels of net oil. This well is in the main pool and will be offset by the Gulf Refining Company by a well on the Vincent lease. The only other completion in the field during the past week was Wilson Broach's No. 6 Lyons, also a work over, which was drilled deeper to 2630 feet and is now pumping 5 barrels of net oil.

HULL PRODUCTION

The average daily production for the Hull field during the past week was distributed approximately as follows:

	Barrels
Republic Production Company	6,600
Gulf Production Company	6,900
The Texas Company	340
Humble Oil & Refining Company	525
Sun Company	250
Yount-Lee Oil Company	150
Theis, Wilkerson & Parker	125
Higgins Oil & Fuel Company	400
Monarch Oil & Refining Company	100
Crown Oil & Refining	125
Houston Production Company	350
Empire Gas & Fuel Company	800
Total	16,665
Last week	15,670

HULL COMPLETIONS

Gulf Production Co.'s No. 4 Thomas Fee, flowing 1800 bbls, 2650 ft.

HULL DRILLING REPORT

Republic Prod. Co.'s Nos. 41 Dolbear, dr 1500 ft; 42 Dolbear, dr 2250 ft; 43 Dolbear, dr 2025 ft; 44 Dolbear, dr 2175 ft; 45 Dolbear, dk; 46 and 47 Dolbear, dk.

Humble Oil & Ref. Co.'s Nos. 9 Hankamer, dr 2150 ft; 4 Guedry, dr 2600 ft; 5 Guedry, dr 500 ft; 6 Guedry, dk; 9 Hankamer, dr 2700 ft; 1 Hooks-Spell, dr 2825 ft.

Sun Co.'s No. 1 Carr Homestead, building standard rig at 3670 ft.

Houston Prod. Co.'s Nos. 2 Barngrover, blew out, stuck drill stem, 25 feet of bottom, shot to side-track and pulled drill stem in two, 2900 ft; 6 Day Cantor, dk.

Monarch Oil & Ref. Co.'s No. 3 Harrison, dr 775 ft; 1 Harrison, casing collapsed, worked over from 1860 to 2620 ft, after side-tracking, pumping 75 bbls.

Higgins Oil & Fuel Co.'s Nos. 2 Republic, dr 1800 ft; 3 Cantor, dr 1175 ft; 1 Finley, dr 2275 ft.

Empire Gas & Fuel Co.'s No. 4 Barngrover, building standard rig, 2900 ft; 5 Barngrover, building standard rig, 3000 ft; 6 Barngrover, dr 1050 ft; 7 Barngrover, dr 2900 ft; 8, 9, 10, 11 and 12 Barngrover, lcn.

Crown Oil & Ref. Co.'s Nos. 4 Hankamer, plugged of bottom joint screen, 1750 ft; 6 Hankamer, dr 1475 ft.

Gulf Prod. Co.'s Nos. 19 Phoenix, dr 2675 ft; 20 Phoenix, dr 2575 ft; 21 Phoenix, dr 1875 ft; 22 Phoenix, dk; 23 Phoenix, dr 2150 ft; 24 Phoenix, dr 1300 ft; 5 Thomas Fee, dk; 10 Morris Phillips, dr 2860 ft; 12 Morris Phillips, dr 1500 ft; 1 Phoenix, deepening.

MARKHAM PRODUCTION

The average daily production for the Markham field during the past week was approximately 200 barrels.

MARKHAM DRILLING REPORT

Humble Oil & Ref. Co.'s No. 1 Markham Prod. Co.'s Hawk, fsh for two joints drill stem, 3970 ft.

Monarch Oil & Ref. Co.'s No. 1 Hardy, sd 3417 ft.

Clem Oil Co.'s No. 14 Myers, working over.

Cherry Oil Co.'s No. 1 Dow, dr 1280 ft, reported show.

Hammill & Anderson's No. 1 Myers, preparing to spud in.

HUMBLE PRODUCTION

The average daily production for the Humble field during the past week was distributed approximately as follows:

	Barrels
The Texas Company	9,425
Galena-Signal Oil Company	1,250
Invincible Oil Company	280
Gulf Coast Oil Corporation	265
Crown Oil & Refining Company	185
Humble Oil & Refining Company	150
Sun Company	265
Castell Oil Company	50
West Production Company	70
Miscellaneous	1,080
Total	13,020
Last week	12,950

HUMBLE DRILLING REPORT

The Texas Co.'s Nos. 221 Landslide, sd 3975 ft; 247 Landslide, dr 2300 ft; 248 Landslide, set 8 inch, dr 1400 ft; 182 Hermann, lcn; 31 Koehler, side-tracking 3160 to 3175 ft; T. D. 3400 ft; 10 W. & P., set casing 2875 ft.

Humble Oil & Refining Co.'s No. 1 G. P. Co.'s lease, building jack, 650 ft.

West Production Co.'s No. 2 West 10 Acres, on jack.

Link Oil Corp.'s No. 1 Riverside, set screen 3057 ft.

J. C. Stribbling & Co.'s No. 1 Rock, dr 3000 ft.

Sun Co.'s No. 25 Mason, testing 3250 ft.

Humble Lease & Dev. Co.'s No. 1 Koinm, dr 2200 ft.

Geo. W. Trammel's No. 1 Davis, dr to cap rock.

Texas Oil Producers Co.'s No. 1 Bissonett, spudded in.

Circle Oil Co.'s No. 11 Bart 25 Acres, below 1200 ft.

Mogul Oil & Ref. Co.'s No. 1 Wimberly, sub., sd 90 ft.

Nebraska Oil & Ref. Co.'s No. 1 Crown, dr below 2700 ft.

Gibraltar Oil & Ref. Co.'s No. 1 Dick, below 1200 ft.

Hulvey & Rochard's No. 7 Gulf tract, dr 700 ft.

Paymasters Oil Co.'s No. 1 Bruce 153 Acres, dr below 2400 ft; 15 Henrietta, dr 300 ft.

SPINDLE TOP PRODUCTION

The average daily production of the Spindle Top field during the past week was approximately 900 barrels.

SPINDLE TOP DRILLING REPORT

Caston Oil Co.'s No. 1 Rowe, tested sw 900 ft, dr deeper 1300 ft.

Veatch Pet. Co.'s No. 1 Gladys, tested dry 1200 ft, dr deeper 285 ft.

Gray Oil Co.'s No. 1 Gladys, pulled screen 975 ft, dr deeper 1050 ft.

Titan Oil Co.'s No. 1 Gladys, dr 800 ft.

Gulf Prod. Co.'s No. 202 Gladys, dr 960 ft.

Unity Oil Co.'s No. 9 Gladys, dk.

Monroe Oil & Gas Co's No. 3 Gladys, dr 400 ft.

Dr. Diffenbacher's No. 1 Sunshine, dk.

Arab et al's No. 1 Chaisson Homestead, dr 400 ft.

Nelson Co.'s No. 1 South Park Ad., dr 400 ft.

VINTON PRODUCTION

The average daily production for the Vinton field during the past week was approximately 5000 barrels.

VINTON DRILLING REPORT

Vinton Pet. Co.'s No. 31 Gray, fsh 1825 ft.

Texas Co.'s No. 14 Gray, dr 1450 ft.

Gum Cove Oil & Ref. Co.'s No. 3 Green, set screen 2300 ft and sd

Gulf Coast Oil Co.'s No. 7 Vincent, fsh 2600 ft.

Rescue Oil Co.'s No. 8 Gray, rig up.

Gulf Ref. Co.'s Nos. 53 G. & N. O., dr 2100; 54 G. & N. G. dk; 55 G. & N. G., rig up; 20 Vincent, dr 2300 ft.

EDGERLY PRODUCTION

The average daily production for the Edgerly field during the past week was approximately 1350 barrels.

EDGERLY COMPLETIONS

Gulf Ref. Co.'s No. 23 Bright-Penn, a work over, pumping 50 bbls, 3100 ft.

EDGERLY DRILLING REPORT

Victory Oil Co.'s No. 9 Lillard, washing to bottom.

Great Southern Pet. Co.'s No. 1 M. J. Muller, twisted off at 3000 ft, side-tracking.

Emerson & Hunter's No. 1 Hunter, sd for pipe, will side-track.

Edgerly Pet. Co.'s No. 2 Drew, dr 970 ft.

Edgerly Oil & Mineral Co.'s No. 3 Wilson, side-tracking 2900 ft.

Gulf Ref. Co.'s Nos. 34 Bright-Penn, dr 3050 ft; 2 Minor Paraffine, dr 2675, working over; 6 Moor, dr 2950 ft., working over.

EVANGELINE PRODUCTION

The average daily production for the Evangeline field during the past week was approximately 550 barrels.

EVANGELINE DRILLING REPORT

C. O. & F. Co.'s No. 53, set screen 2050 ft.

Gulf Ref. Co.'s No. 4 Martin, dk; 26 J. C., set screen 1950 ft; 32 J. C., dr 1540 ft.

BATSON PRODUCTION

The average daily production for the Batson field during the past week was approximately 1400 barrels.

BATSON DRILLING REPORT

Paraffine Oil Co.'s Nos. 3 Paraffine 15 Acres, dr 475 ft; 53 Paraffine 12 Acres, dr 500 ft; 3 Lejarza, dk.

Ada-Bell Oil Co.'s No. 41 Honeymoon, dr 550 ft.

Sun Co.'s No. 66 Paraffine, dr 875 ft.

S. R. Buchanan's No. 5 Audry, dr 1360 ft.

W. G. Christian's No. 1 Christian, dr 1775 ft.

East Batson Oil Co.'s No. 11 State, set screen 475 ft.

Gulf Prod. Co.'s Nos. 10 Phoenix Oil Co.'s Fee, preparing to pump 1450 ft; 59 Choate, dr 500 ft.

W. J. Hickman was in Houston last week from his headquarters in Shreveport, La., to attend the meeting of Humble Oil & Refining Company department heads. Lum Price of Ardmore, Okla., was also in Houston for the same purpose.

Midway-Sunset Field Leads on West Coast

Los Angeles, Oct. 18.—California's Midway-Sunset field leads all individual oil fields in the United States in the matter of production, according to the latest official figures available which have been compiled to cover August output of the country.

Midway-Sunset's August daily production was 106,684 barrels, the total production 3,305,964 barrels. At the present rate this field is producing more than the Burkburnett field in Texas when at its best, which was 102,000 barrels daily in 1919. The nearest field to the Midway is the Breckenridge-Stephens in Texas, which is averaging 84,000 barrels daily.

Compared to the average daily production in February last, the Midway-Sunset has increased from 85,200 barrels.

In the compilation referred to the Whittier-Fullerton field in Orange County, California, is in third position, with an average daily production of 78,066 barrels, an increase of 5600 barrels daily over February, and Burkburnett is in fourth place with 68,685 barrels average daily for August and 95,600 in February, showing a decrease of 27,000 barrels daily.

WORKOVER A GOOD WELL

Los Angeles, Oct. 18.—The Standard Oil Co., after redrilling and reopening to 4445 feet Murphy-Coyote No. 51 in the Whittier field, has brought in a well making 1300 barrels of oil and 3,500,000 cubic feet of gas a day. This Murphy well is the biggest one this year in the Whittier field, and came as a distinct surprise, but demonstrates what may be expected of that part of the field from deep drilling.

GAS FLOW INCREASING

Los Angeles, Oct. 18.—The increased production of natural gas from the wells around the dry Tulare Lake in Kings County indicates the possibility that it has reached a stage where it can be commercialized, and to this end, in answer to an application, the board of supervisors of Kings County have advertised for sale a franchise for its distribution.

Navy Rejects Offers by Shell and General Petroleum on Fuel Oil

LOS ANGELES, Oct. 18.—The United States navy has rejected the offers of both the General Petroleum Corporation and the Shell Company of California to supply ten per cent of its fuel oil needs on the Pacific Coast during October, November and December. The General Petroleum's bid was $2.25 a barrel for deliveries at San Pedro only, and that of the Shell $2.35 delivered at Martinez only.

As the navy has set the arbitrary price of $2 a barrel and several companies bid that figure also, it is more than likely that the Shell's product will continue to be commandeered when the navy may find itself in need.

The General Petroleum has been supplying all naval demands since the federal court at Los Angeles declined to forbid the seizures by force and upheld the navy's superior right to the oil. However, especially because of the court's further declaration that the secretary has no power to fix arbitrary prices, presumably there will be an appeal to court.

The contracts covering the current three months awarded to the Standard and Union at $2 a barrel require that the former furnish 30 per cent of the navy's requirements and the latter 20 per cent. The Standard was also given the contract to furnish one-third of the navy's gasoline needs on the coast at 24 cents a gallon delivered at Richmond and 25½ cents delivered at San Francisco.

The Associated's offer to furnish 25 per cent of naval fuel oil needs will probably be accepted. The company offers the oil at $2 at Port Costa, with delivery charges at San Francisco of 10 and 12 cents, according to size of deliveries up to 500 barrels. It has secured the contract to furnish distillate at 17½ cents.

OLD WELL DECLINES

Los Angeles, Oct. 18.—Chapman No. 1 of the Union Oil Company in the Richfield field, the original gusher of the field, which blew in more than a year ago and for months kept up a steady flow of better than 1000 barrels a day, has recently been declining until now it is doing but 750 barrels. Chapman No. 3 continues to hold its own at 150 barrels. Morse No. 1 is holding up in wonderful manner, making close to 1500 barrels, and the Thompson-Goowin No. 1 has been flowing steady for several months at 850 barrels.

800 BARRELS DAILY

Los Angeles, Oct. 18.—The West Coast Oil Co.'s No. 78, at Olinda, has been brought in with an 800 barrel daily production. It was completed at 2800 feet and the oil is 16 gravity.

DEAL INVOLVES $750,000

Los Angeles, Oct. 18.—The Royal Dutch Shell interests as represented by the Guardian Oil Company has completed the purchase of the properties of the W. K. Oil Company and the Turner Oil Company, in section 2-20-15, Coalinga field, Fresno County. The transaction was carried out by Balfour, Guthrie & Co. of San Francisco, and involved $750,000.

NEW WELL NEAR TAFT

Los Angeles, Oct. 18.—The Laymance Oil Company has just brought in its first well in the center of the northwest quarter section 16-32-23, near Taft, which it recently secured when it purchased the Midland and Lockwood Oil Companies. The well is producing 200 barrels a day of 24 gravity oil from a lower sand than any other well in the vicinity, and proves that a light oil underlies the whole quarter.

Los Angeles, Oct. 18.—The Standard has begun shipping crude from its new well in the coast in Orange County. It is producing around 200 barrels a day and the product is going to the El Segundo refinery. A pipe line will soon be laid, for it has two more wells soon to come in.

WILL J. HANNA DEAD

Houston, Texas, Oct. 20.—Will J. Hanna, age 38 years, with the production department of the Humble Oil & Refining Company, died at 11 p. m. Monday at the Hanover apartments in Houston.

He is survived by his widow, two brothers, Robert Hanna of Belton, Missouri, and David Hanna, of East Pittsburgh, Pennsylvania, and two sisters, Miss Mary Hanna and Mrs. Jane Annett of Ireland.

Mr. Hanna was a member of Gray Lodge No. 329, Ancient, Free and Accepted Masons and a member of Arabia Temple at Houston. He was also a member of the Knights of Pythias lodge of this city. Funeral arrangements will be made later.

TO PLACE NEW BIT ON MARKET

Arrangements have been made by Judge John W. Parker, G. A. Humason and W. E. Lange, all of Houston, who own the patent rights to a collapsible bit invented by Humason, to put the bit on the market. The bits will be made by the Lucey Manufacturing Corporation in its plant at Houston. A practical demonstration of the first bit will be made shortly.

NEW HOTEL OPEN

Wichita Falls, Texas, Oct. 20.—The Kemp hotel, last of the major building operations at Wichita Falls, has been opened. The hotel is under management of Lee Huckins of Oklahoma City. It will cater to the oil fraternity.

Los Angeles Commerce Consists Largely of Petroleum Products

LOS ANGELES, Oct. 18.—The officially recorded valuation of the mineral oils, petroleum products, forming a part of the commerce of Los Angeles for the fiscal year ending June 30, 1920, was 24.5 per cent of the whole. The grand total value of the commerce was $153,919,010, and that of petroleum products $37,644,100.

The inbound foreign oils had a value of $148,272, and consisted of 70,964 barrels of fuel oil and 3432 barrels of gasoline.

The exports of California oils reached a total of 9,797,669. Compared with the total value of all exports, $19,876,730, the value of oils was within a fraction of 50 per cent of the whole.

Outbound domestic shipments of all commerce had a value of $44,947,906, and of this the oils were valued at $26,490,300, or 58 per cent.

In quantities domestic shipments totaled 10,782,485 barrels and foreign shipments 2,015,533 barrels. In the latter kerosene led with 1,102,338 barrels, and the commodity of least quantity was gasoline, 5864 barrels.

In the domestic shipments fuel oil led with 9,467,720 barrels, followed by gasoline, 733,574; distillate, 422,630; kerosene, 138,010; lubricants, 260; not otherwise stated, 20,291.

CADDO PRODUCTION

The estimated daily average production of the Caddo field the past week is divided about as follows:

	Barrels
Gulf Refining Company	5,000
The Texas Company	3,900
Standard Oil Company	2,100
Caddo Central	300
Louisiana Oil & Refininf Company	400
Miscellaneous	5,800
Total	17,500
Last week	17,200

CADDO COMPLETIONS

Adamson Oil Co.'s No. 3 Muslow, 4-20-15, 35 bbls, 2180 ft.

Republic Oil & Gas Co.'s No. 2 Sellington, 28-21-15, 15 bbls, 2130 ft.

G. W. Strange Oil & Ref. Co.'s No. 7 Youree, 26-20-15, abn, 2300 ft.

CADDO DRILLING REPORT

Adamson Oil Co.'s No. 4 Muslow, 4-20-15, setting 6-inch 2000 ft. American Oil & Ref. Co.'s No. 2 Harrell, 2-21-16, to set 6-inch 1000 ft. Ansonia Oil Co.'s Nos. 2 Dickson, 36-21-15, sd 2180 ft. Arkansas Nat. Gas Co.'s No. 149 Fee, 25-17-14, rigged to dr.

J. W. Barnes' No. 3 Murray, 28-21-15, set 6-inch 2160 ft. Andrew P. Bents' No. 1 Smith, 35-21-15, rigged to dr. Bethany Oil & Gas Co.'s No. 1 Davis, 17-16-16, lcn.

J. E. Carnahan's No. 1 Harrell, 1-21-16, killed blowout, sd 1050 ft. Choate Oil Corp.'s No. 2 Glassell Bros., 25-20-15, dr 1250 ft. Curtis et al's No. 4 Owens, 21-22-15, set 6-inch 1020 ft.

Dixie Oil Co.'s Nos. 27 Robertshaw, 13-21-15, dk; 9 Slattery, 27-21-15, dr 2600 ft; 29 Robertshaw, 14-21-15, dr 2650 ft; 34 Robertshaw, 14-21-15, set 6-inch 2310 ft; 35 Robertshaw, dk. Doan Oil Co.'s Nos. 3 Louisiana Lbr. Co., 5-20-15, to set liner 2210 ft; 4 Louisiana Lbr. Co., dr 2100 ft.

Emerald Oil Co.'s Nos. 2 Gamm, 26-21-15, dk; 1 Dickson, 15-21-14, testing 1050 ft. Empire Realty Co.'s No. 1 Central Prod. Co., 36-21-16, dr 2250 ft.

Faps Oil Co.'s No. 1 School Land, 16-22-15, dr 450 ft. Fortuna Oil Co.'s Nos. 11 Robertshaw, 23-21-15, dk; 12 Robertshaw, set 6-inch 2290 ft; 10 Herndon, 22-21-15, dr out plug 2280 ft.

Giles & Herring's No. 1 Moore, 24-21-15, to pump 2395 ft. Greer Oil Co.'s No. 28 Jolly, 22-22-15, lcn abn. Gulf Ref. Co.'s Nos. 1 Taylor-Trosper, 17-16-18, set 6-inch 2865 ft; 200 Ferry Lake, 13-20-16, setting liner 2330 ft; 201 Ferry Lake, 14-20-16; 202 Ferry Lake, 29-20-16, tested dry, to dr deeper 2300 ft; 203 Ferry Lake, 26-20-16, set 6-inch 2040 ft; 204 and 205 Ferry Lake, 13-20-16, dks; 206 Ferry Lake, 29-20-16, dk; 5 Heilperin, L. B., 21-20-16, dr 1450 ft; 6 Heilperin, L. B., dk. Great Southern Prod. & Ref. Corp.'s No. 1 Ellerbe, 9-20-15, to pump 2190 ft.

Higgins Oil & Fuel Co.'s No. 1 Ross, 17-20-15, dr 2250 ft. Homer-Okla. Oil Co.'s No. 3 Allen, 35-21-15, sd 2240 ft. Humble Oil & Ref. Co.'s No. 7 Noel, 19-21-14, dk.

Kendall & Dixon's No. 1 Jeter, 8-19-16, sd 2100 ft.

Louisiana-Apex Oil Co.'s No. 1 Simms, 23-20-16, dk. Louisiana Consolidated Oil & Ref. Co.'s Nos. 6 Jolly-Spearman, 23-22-15, to pump 1023 ft; 25 Jolly, 22-22-15, to pump 100 ft; 13 Peak, 23-22-15, to pump 1000 ft. Last Chance Oil Co.'s No. 1 La. Gas Co., 33-21-15, dr 1150 ft. La. Prod. Co.'s Nos. 1 Noel, 7-21-14, sd 2300 ft; 2 Noel, 7-21-14, dk. La. Oil & Ref. Corp.'s Nos. 10 Crye Lane, 22-21-15, set 6-inch 2240 ft; 4 Bollinger, 5-17-14, sd 980 ft. La. Mutual Oil Co.'s No. 5 Heilperin, 26-21-15, dk. Little River Oil Co.'s No. 1 Croom, 35-20-16, dr 1300 ft.

Mayfair Oil Co.'s No. 1 Hendricks, 20-16-14, set 6-inch 2480 ft. Mo.-La. Oil Co.'s No. 2 Thigpen & Herold, 4-20-15, dr 1400 ft.

Nowlin & Trahan's No. 2 Allen, 23-22-15, dr 500 ft.

Oil Rox Pet. Co.'s No. 1 Stacke, 9-23-16, dk. Old Settlers Oil Co.'s No. 12 Lynn, 12-21-15, set 6-inch 2250 ft.

Planters Oil Co.'s No. 3 Noel, 7-21-14, to pump 1890 ft.

Reisor Oil & Ref. Co.'s No. 2 Reisor, 1-16-15, sd 1250 ft. Republic Oil & Gas Co.'s No. 3 Sellington, 28-21-15, fsh 1750 ft. Reclamation Oil Co.'s No. 5 Harrell, 18-21-15, dr 650 ft. D. C. Richardson's Nos. 3 Huckaby, 11-21-15, dk; 4 Johnson, 25-21-15, dk; 2 Player, 26-21-15, dk; 5 Askew, 28-21-15, set 6-inch 2160 ft. S

Sun Co.'s No. 132 Spell, 29-21-15, rigging to dr. Sam Sitrim's No. 5 Dillion, 22-20-15, dr out plug 2050 ft. Service Oil Co.'s Nos. 1 Big Four, 4-20-15, to pump 2185 ft; 2 Big Four, rigging to dr. G. W. Strange Oil & Ref. Co.'s Nos. 8 Youree, 26-20-15, dr 1500 ft; 12 Dickson, 27-20-15, fsh 2250 ft; 13 and 14 Dickson, dks; 15 Dickson, lcn. State Mutual Oil Co.'s No. 1 Boisseau, 34-21-16, dk.

The Texas Co.'s Nos. 1 Gill & Lipscomb, 19-16-16, set 4½-inch 2870 ft; 2 Hicks & Payne, 21-21-15, rigged to dr. Temple-Desdemona Oil Co.'s No. 1 Wumple, 11-20-15, dr 1000 ft. Texas Prod. & Lsg. Co.'s No. 1 Rudersdorf, 11-20-16, dr 1950 ft.

V. K. F. Drilling Co.'s No. 1 Barnhart, 21-20-15, rigged to dr.

Webster & Roy's No. 1 Hall, 23-15-16, sd 2780 ft. Wasson Oil & Gas Co.'s No. 2 Wasson, 26-19-15, sd 3020 ft. Woodbine Oil Co.'s Nos. 3 Dickson, 25-20-15, rigging to dr; 4 Dickson, rigging to dr.

Ben Rice of the law firm of Rice & Lyons, well known in the oil industry, has returned to Tulsa from New York.

T. C. Moss, manager of the Dallas office of the Acme Petroleum Company, was in Wichita Falls last week.

R. W. Curry, assistant to the chief scout of The Texas Company at Cisco, has returned from a visit to the Dallas Fair.

Salt Creek Field Is Ahead of Other Wyoming Sections

The information in the tables below has been brought down to the date of October 1, 1920. The production of crude petroleum is estimated and stated in barrels of 42 gallons each. The production and drilling figures were obtained from different sources, and have been carefully checked and are approximately correct.

Wyoming Producing Fields
(Recapitulation)

District	Prod. wells	Drg. wells	Rigs & lcns.	Est. Daily Production Marketed	Shut in
Elk Basin	113	5	2	1,850	
Byron	9	2	1	75	
Crystal Creek	1				40
Greybull	13	3		40	
Torchlight	34			40	
Blue Springs	1				10
Wild Horse Butte	1				30
Red Springs	1				15
Warm Springs	28			300	
Hamilton Dome	12	4	3		900
Grass Creek	305	5		3,825	
Thornton	4	2		30	
Osage	10	32	32	10	220
Maverick Springs	11	4	2		1,350
Pilot Butte	19	1		205	
Hudson	30	1		300	
Dallas	25	3		300	
Salt Creek	186	20	37	22,000	10,000
Big Muddy	238	17	4	6,430	
Bolton Creek	2	6			50
Lost Soldier	26	11	1	1,500	
Ferris Field	5	23	8		650
Rock River	15	32	11	5,200	
Buck Creek	9	22		505	
Mule Creek	18	14	4	750	
Totals	1,116	207	81	43,335	13,265

Montana

Only one district in Montana is producing crude petroleum in commercial quantities—Cat Creek anticline in Fergus County. There are four producing wells in this field at the present time, with a combined daily production of 1500 barrels. The producing wells are from 650 to 1600 feet in depth. There are nine wells drilling in the Cat Creek field at the present time, and rigs and locations for as many more.

WILL TRY TO CHECK CRIME IN WICHITA COUNTY FIELDS

Wichita Falls, Texas, Oct. 20.—In an effort to check the wave of crime over the Wichita Falls oil district, a special grand jury has been charged in the Eighty-Ninth District Court by Judge P. A. Martin. A detachment of State Rangers is helping the jury.

One of the first actions was against a deputy of the Sheriff's office. He was charged with using his influence to have witnesses perjure themselves before the jury.

Two special deputies were recently killed at Kemp City in a raid on a gambling den. There have been other attacks on peace officers and others trying to enforce the law. Five men are now held on murder charges.

One of the latest acts on the part of the criminal element was a raid on a poker game in the fashionable part of the city. It was reported to the police that $10,000 was taken from the game by masked bandits. Rangers and police later in the night staged a running battle with men supposed to have committeed the robbery.

In charging the special grand jury, Judge Martin asked that big gambling games in the city be considered as well as games in the dens of the oil fields.

Claiborne Pool Extended by Texas Co. Well in Deep Sand

SHREVEPORT, LA., Oct. 19.—The completion by the Texas Company of its No. 1 Lewis in section 25-21-8 a little below 2000 feet for about 2000 barrels means an extension of the Claiborne pool about one-fourth of a mile to the southwest. The United Oklahoma Oil & Gas Company recently completed two wells near the late Texas Company extension well, one for 2000 barrels, while the latest United well was estimated to be good for 7500 to 10,000 barrels, both in the deep sand.

This revives interest in this section of the pool and new locations are being made in that direction. The completions the past week brought about an increase in the daily average production of the field, the total now being about 55,000 barrels.

The late completions in the Bull Bayou and Caddo fields have not been large or numerous, but the daily average production of each field has shown a gain. Bull Bayou is now credited with 14,800 barrels while Caddo has a daily average of 17,500 barrels.

CLAIBORNE PRODUCTION

The estimated daily average production of the Claiborne field for the past week is divided about as follows:

	Barrels
Standard Oil Company	12,000
Gulf Refining Company	8,500
United Oklahoma	8,000
Louisiana Oil & Refining Company	5,000
Gilliland Oil Company	6,300
Simms Oil Company	3,700
White Oil Corporation	3,950
The Texas Company	2,200
Sinclair Oil Corporation	1,500
Arkansas Natural Gas	1,600
Miscellaneous	2,250
Total	55,000
Last week	50,110

CLAIBORNE COMPLETIONS

Caddo-Claiborne Oil & Gas Co.'s No. 3 Gladney, 14-20-7, abn, 3030 ft.

Standard Oil Co.'s Nos. 24 Lowenberg, 13-21-8, 40 bbls oil and some water, 1425 ft; 24 Shaw-Palmer, 25-21-8, 2200 bbls, 2030 ft; 10 Wheeler, 17-21-7, 65 bbls, 1480 ft.

Trans-Continental Oil Co.'s No. 1 Lay, 35-22-6, abn, 3650 ft.

United Oklahoma Oil & Gas Co.'s Nos. B-2 Shaw, 25-21-8, 125 bbls, 2030 ft; B-8 Shaw, same section, 12,500 bbls, 2030 ft.

CLAIBORNE DRILLING REPORT

Alto Oil & Gas Co.'s No. 1 Owens, 30-23-6, junk in hole 1740 ft. Arkansas Natural Gas Co.'s No. 117 Langston, 24-21-8, sd 1330 ft.

Baldwin et al's No. 1 Burton, 18-21-7, sd 1500 ft. Benangus Oil Co.'s Nos. 1 Camp, 23-20-8, sd 190 ft; 1 Fincher, 5-20-7, sd 1180 ft. Bowie Claiborne Oil Co.'s Nos. 6 Featherstone, 20-21-7, set 6-inch 1960 ft; 9 Featherstone, to test 1240 ft. Burk Homer Oil Co.'s No. 1 Buckner, 24-23-7, sd 90 ft. Brooks et al's No. 1 Burton, 18-21-7, sd 1190 ft.

Circle Oil Co.'s Nos. 1 Alford, 6-22-4, dk; 1 Gryder, 17-21-7, rigged up. Claiborne-Louisiana Oil Co.'s No. 3 McClung, 29-21-7, set 6-inch 1390 ft. Conservative Oil Co.'s No. 1 McClung, 29-21-7, sd 1600 ft.

D'Arbonne Oil Co.'s Nos. 1 Langston, 19-21-7, sd 1300 ft; 2 Langston, sd 1390 ft; 3 Langston, to test 1390 ft. Denman et al's No. 1 Harmon, 17-21-7, dry, sd 2120 ft.

Fawn Creek Oil & Gas Co.'s No. 2 Kinder, 35-22-7, dr 350 ft. Freedman & Rowe's Nos. 1 Hardy, 32-21-7, sd 2160 ft. Frost Oil Co.'s No. 1, 14 Chatman, 31-21-7, dk. Folse et al's No. 1 Harmon, 17-21-7. Fullenwider et al's No. 1 Fullenwider, 7-23-6, set 6-inch 2210 ft.

Gilliland Oil Co.'s Nos. 8 Jackson, 24-21-8, sd 1410 ft; 15 Oakes, 30-21-8, testing 1420 ft; 16 Oakes, dk; 17 Oakes, dk; 18 Oakes, dr 500 ft. Glassell & Marren's No. 1 Shaw, 23-21-8, sd 1400 ft. Gulf Port Claiborne Oil Co.'s No. 1 Knighton, 27-20-8, set 6-inch 1880 ft. Gulf Refining Co.'s Nos. 6 Garrett, 18-21-7, lcn; 31 West, 18-21-7, dr 300 ft second hole; 1 White, 36-21-8, dr 1150 ft; 2 McClung, 29-21-7, rigged to dr.

Hall, Trustee's, No. 2 Duke, 18-23-5, rigged to dr. J. H. Henry's No. 1 Todwin, 22-21-8, lcn. Homer Consolidated Oil Co.'s No. 1 Bethany, 11-21-8, sd 1130 ft. Homer Oil Corp.'s Nos. 8 Shaw, 30-21-7, dk; 9 Shaw, set 4½-inch 1975 ft. Homestead Oil Co.'s No. 1 Tuggle, 31-21-6, sd 1940 ft. Homer Union Oil Co.'s No. 1 Shaw, 24-21-8, sd 1430 ft; 2 Shaw, 36-21-8, sd 2010 ft.

Walter Keeble's No. 1 Sales, 5-22-7, sd 2845 ft. Keen & Wolf Oil Co.'s No. 4 Norton, 13-21-8, dk. E. L. King's No. 1 Featherstone, 20-21-7, dk.

Lane Oil Co.'s No. 1 Shaw, 24-21-8, sd 1410 ft. Lisbon Oil Co.'s No. 1 Patton, 36-21-5, sd 1740 ft. Louisiana Oil Ref. Corp.'s Nos. 1 Harmon, 9-21-7, lcn abn; 11 Jackson, 23-21-8, sd 1730 ft; 12 Jackson, sd 1530 ft; 19 and 14 Jackson, 23-21-8, lcns abn; 15 and 16 Jackson, 24-21-8, lcns abn; 17 Jackson, 24-21-8, dk; 18 Jackson, sd sw, 1450 ft; 19 Jackson, dk; 20 Jackson, sd, sd 1840 ft; 1 Langston, 19-21-8, sd 1480 ft; 9 Langston, sd 1440 ft. Lou-Mutual Oil Co.'s No. 1 Merritt, 17-21-7, set 6-inch 1210 ft.

J. H. McMillan's No. 1 Thompson, 16-22-4, dk. Mayfair Oil Co.'s No. 2 James, 14-22-4, sd 2500 ft. S. A. McGeath's No. 1 Barber, 5-22-4, dk. Mills Bennett's No. 1 Merritt, 32-21-7, dk.

Ohio Fuel Oil Co.'s No. 1 Silas Norton, 13-21-8, dk. J. J. O'Toolis' No. 2 Smith, 8-21-7, dr 1100 ft.

Pan-American Oil Co.'s No. 1 Frye, 36-20-8, dr 2785 ft. J. M. Parker's No. 1 Harmon, 16-21-7, sd 1930 ft. Production Oil Co.'s Nos. 1 Bonner, 15-21-8, dk; 1 Burton, 18-21-7, dry, sd 1690 ft. Prudential Oil Co.'s No. 1 Norman, 22-21-8, sw, sd 2290 ft.

Ranger-Homer Oil Co.'s No. 1 Norman, 5-21-6, dk. Rapides-Claiborne Oil Co.'s No. 1 Shaw, 31-21-7, dk. Rebel Oakes Oil Co.'s No. 1 Featherstone, 20-21-7, dk. Richardson Pet. Co.'s No. 1 Bridgeman, 12-21-8, sd 1500 ft. Rowe Oil Corp.'s Nos. 1 Wilson, 13-21-8, sd 3210 ft; 5 Hardy, 32-21-7, set 6-inch 1290 ft. Roxana Pet. Corp.'s No. 1 Taylor, 14-23-8, sd 2890 ft.

Section 30 Oil Co.'s No. 1 Pressley, 11-21-8, dk. Simms Oil Co.'s No. 3 Japhet, 32-21-7, sidetracking 2230 ft; 6 Japhet, dk; 10 Japhet, dk; 11 Japhet, set 6-inch 1300 ft; 6 McClung, 29-21-7, dk; 8 McClung, set 6-inch 1290 ft; A-1 McClung, lcn; A-2 McClung, dk. St. David Oil Co.'s No. 1 Burton, 18-21-7, to dr deeper 1410 ft. Standard Oil Co.'s Nos. 17 Lowenberg, 13-21-8, set 6-inch 1210 ft; 23 Lowenberg, 13-21-8, dr 1150 ft; 27 Lowenberg, 13-21-8, to pump 1425 ft; 28 Lowenberg, 13-21-8, dr 300 ft; 29 Lowenberg, lcn; 30, 31 and 32 Lowenberg, 13-21-8, lcns; 5 McClung, 29-21-7, lcn; 6 McClung, to test 1445 ft; 4 Mitchell, 29-21-7, to pump 1390 ft; 8, 10, 11 and 12 Guy Oakes, 29-21-7, lcns; 14 Guy Oakes, 29-21-7, dk; 15 Guy Oakes, dk; 16 and 17 Guy Oakes, dks; 18 and 19 Guy Oakes, lcns; 20 Guy Oakes, dr 1000 ft; 7 Shaw-Palmer, 30-21-7, dk; 10 Shaw-Palmer, sd 1880 ft; 13 Shaw-Palmer, 25-21-18, to pump 2030 ft; 18 Shaw-Palmer, 36-21-8, dk; 19 Shaw-Palmer, 25-21-8, dk; 20 Shaw-Palmer, bailing 6-inch 1965 ft; 21 Shaw-Palmer, dr out plug 1950 ft; 22 Shaw-Palmer, set 6-inch 1930 ft; 23 Shaw-Palmer, dk; A-11 and A-12 Shaw-Palmer, 31-21-7, lcns; 7 Wheeler, 17-21-7, set 6-inch 1280 ft; 8 Wheeler, dr stem stuck 740 ft; 9 Wheeler, lcn. Sterrett & Simmons' No. 1 Featherstone, 20-21-7, sd 1490 ft. Swails Oil Co.'s No. 1 Fortson, 24-21-7, dr 250 ft.

Texarkana-Homer Oil Co.'s Nos. 1 Bonner, 22-21-8, dk; 1 King, 26-21-8, dr 1300 ft. The Texas Co.'s No. 1 Lewis, 25-21-8, dr 1400 ft. Timpson Oil Co.'s Nos. 2 McClung, 29-21-7, sd 1500 ft; 3 McClung, dk. Trinity Oil Co.'s No. 1 Bulloc, 2-20-7, dk.

U. R. M. Assn.'s No. 1 Langston, 19-21-7, setting 8-inch 950 ft. United Oklahoma Oil & Gas Co.'s Nos. 3 Shaw, 25-21-8, dk; B-3, B-4, B-5 and B-6 Shaw, lcns; B-7 and B-8 Shaw, dr 950 ft.

Warwick et al's No. 1 Fields, 22-19-5, fsh 2210 ft. Westheimer et al's No. 1 White, 36-21-8, sd 1540 ft. W. K. Oil Co.'s No. 1 Crow, 33-21-8, sd 1770 ft. White Oil Corp.'s Nos. 2 Norman, 15-21-6, lcn; 12 Oakes, 30-21-7, rigged to dr; 10 Wheaton, 23-21-8, sidetracking 1450 ft; 14 Wheaton, 23-21-8, rigged to dr; 15 Wheaton, dr 750 ft. Wichita Oil Co.'s No. 1 Thomas, 15-21-7, dk. Wilder Oil & Gas Co.'s No. 2 Wilson, 13-21-8, sd 1180 ft. Wonderfield Oil Corp.'s No. 3 Featherstone, 20-21-7, dry, sd 1540 ft.

George Jehle of the Clifford Bell Petroleum Company of Wichita Falls was fraternizing with his Tulsa friends last week-end.

M. R. Bump, chief engineer of the Doherty interests, has been visiting the Empire Gas & Fuel organization in Bartlesville, Okla.

SINCLAIR'S NO 3 ZURITA IN MEXICO WHICH HAS BEEN PRODUCING FROM 10,000 TO 15,000 BARRELS DAILY, ALTHOUGH "PINCHED IN." IT CAME IN FEBRUARY 21, 1914. —Photo courtesy Sinclair's Magazine.

BULL BAYOU PRODUCTION

The average daily production of the Bull Bayou field the past week is divided about as follows:

	Barrels
Gulf Refining Company	3,600
Continental Asphalt	1,800
The Texas Company	1,800
Fortuna Oil Company	950
Sinclair Oil Corporation	580
Standard Oil Company	300
Miscellaneous	5,770
Total	14,800
Last week	14,200

BULL BAYOU COMPLETIONS

DeSoto Parish

Boone Oil Co.'s No. 2 Giauque, 5-11-11, 6,500,000 cu ft dry gas, 2700 ft.

Red River Parish

Continental Asphalt & Pet. Co.'s No. A-13 Robinson, 36-13-11, 25 bbls, 2850 ft.

Gulf Refining Co.'s No. 10 Gray-Hook, 5-12-10, 10 bbls, 2820 ft; 12 Gray-Hook, 125 bbls, 2770 ft; 13 Gray-Hook, 125 bbls, 2775 ft.

Sinclair Oil Co.'s No. B-4 Nelson, 31-13-10, 25 bbls, 2770 ft.

BULL BAYOU DRILLING REPORT

DeSoto Parish

Amereda Pet. Co.'s Nos. 1 Prudhome, 20-12-11, dr 1600 ft; 1 King, 36-12-11, dr 2500 ft. Anchor Pet. Co.'s No. 1 Baker, 3-11-14, sd 2770 ft. Arkansas Natural Gas Co.'s Nos. 143 Williams & Elam, 21-12-11, to pump 2670 ft; 145 Williams & Elam, sd 1540 ft; 146 Williams & Elam, setting 6-inch 2545 ft; 148 Williams & Elam, dr 2100 ft. Atkins & French's No. 1 Mason, 28-12-11, sw, sd 2850 ft. Anderson Drilling Co.'s No. 1 Bartley, 26-13-16, dr 2100 ft.

Belchie & Laskey's No. 1 Giauque, 15-12-11, set 6-inch 2590 ft. Boone Oil Co.'s Nos. 1 Giauque, to pump 2820 ft; 3 Giauque, 7-11-11, dr 500 ft. Brazos River Oil Corp.'s Nos. 2 Brownfield, 4-12-12, sd 2610 ft; 1 Williams, 20-12-12, sd 2640 ft; 1 Roach, 31-13-12, sd 2775 ft; 2 Goldsby, 8-12-12, sd 1340 ft; 3 Goldsby, 18-12-12, sd. Bull Bayou Queen Oil Co.'s No. 1 Porter, 10-13-12, dk.

Clark & Greer's Nos. 4 Giauque, 21-12-11, dr 300 ft; 5 Giaque, dr 2000 ft; 6 Giaque, dk.

Depositors Oil Co.'s No. 1 Hart, 21-12-11, sw, setting 4½-inch 2690 ft. Dyer & Lanier's No. 1 Giauque, 15-12-11, dr 600 ft.

Faps Oil Co.'s No. 2 Williams & Elam, 21-12-11, dr 1700 ft.

Gilliland Oil Co.'s No. 3 King, 23-12-11. Gulf Ref. Co.'s No. D-13 McCormick, 25-13-12, dr 1600 ft. Garrison Coal & Oil Co.'s No. 1 Bland, 11-11-16, dk. Goodman et al's No. 1 Hollingsworth, 31-12-20, lbr. on lcn.

Huntley Synd.'s Nos. 1 Hill, 4-10-13, dr 2700 ft; 1 Harris, 6-10-13, sd 260 ft. Hughes Pet. Co.'s No. 1 Lafitte, 29-12-11, dr 1400 ft.

Ben Johnson et al's No. 1 Roberts, 36-12-13, dk.

Kansas & Gulf Oil Co.'s Nos. 6 Harp, 31-12-11, dr 2400 ft; 7 Harp, 36-12-11, dr 1200 ft; 8 Harp, dk; 9 Harp, dr 1100 ft; 10 Harp, dk; 11 Harp, dr 300 ft.

Lockwood Oil Co.'s No. 1 School Land, 16-12-11, sd 2770 ft. Louisiana Premier Oil Co.'s No. 1 Randall, 9-12-12, sd 2160 ft. Louisiana Lee Oil Co.'s No. 1 Powell, 30-12-11, fsh 2880 ft.

C. F. Merritt et al's No. 1 Billingsley, 1-11-16, dk. Meyer et al's No. 1 Nickey, 7-13-12, lumber on lcn.

Noble Oil Co.'s No. 1 School Lands, 16-12-11, dk.

Palmer Trust Co.'s Nos. 5 Jenkins, 21-12-11, rigged up. Pilgrim Oil Co.'s No. 1 Ramsey, 33-13-16, sd 2825 ft. Pittsburgh-La. Oil Co.'s No. 1 Wilcox, 34-11-14, lumber on lcn.

Scott et al's No. 1 Patterson, 34-11-14, dk. Staley & Green's No. 1 Bradford, 8-12-14, sd 210 ft. Standard Oil Co.'s Nos. 3 Hollingsworth, 36-12-11, rigged up; 4 Hollingsworth, lcn.

Tarver et al's Nos. 1 Chaffraix, 31-12-10, dr 1600 ft; 1 Government Land, rigged. Texas Homer Oil Co.'s Nos. 1 Williams, 3-12-12, sw, sd 2550 ft; 2 Williams, dk. Texas Pet. Co.'s No. 1 Jenkins, 3-12-12, sd 1300 ft. Texas Standard Oil Co.'s No. 2 Sutherland, 3-12-14, dr 350 ft. The Texas Co.'s Nos. 3 Giauque, 1-11-12, sw, 2890 ft; 28 Wemple, 22-12-11, to pump 2660 ft; 29 Wemple, setting 4½-inch 2600 ft.

U. S. Drilling Co.'s Nos. 1 White, 20-12-11, dr 1000 ft; 1 Bond, 23-12-11, rigged. United Texas Pet. Co.'s No. 1 Giauque, 8-11-11, sd 2700 ft.

Van Steel Oil Co.'s No. 1 Caraway, 23-12-16, sd 2660 ft.

Gilbert Williams et al's No. 1 Stayke, 21-15-14, sd 920 ft. Williams Pet. Co.'s No. 1 Lumpkin, 33-11-13, sd 3170 ft.

Red River Parish

Ackerman Oil Co.'s No. 1 Nelson, 31-13-10, sd 2840 ft. Avery et al's No. 1 Johnson, 17-12-10, sd 2570 ft.

Bayou Pierre Oil & Prod. Co.'s No. 1 State Land, 23-12-11, dr 450 ft. Breckenstein et al's No. 1 Chaffraix, 30-12-10, to resume dr 2610 ft. Belchie & Laskey's Nos. 12 T. & P., 5-12-10, testing 2780 ft; 16 T. & P., dr 1100 ft. Bull Bayou Mystic Oil Co.'s No. 1 Sample, 2-14-11, rigged. Bull Bayou Oil Co.'s Nos. 9 Armistead, 23-12-11, junk in hole 2670 ft; 14 Armistead, 24-12-11, dk; 15 Armistead, lcn.

Godfrey Cabbott et al's Nos. 2 Westdale Plantation, 26-14-11, sd 2640 ft; 3 Westdale Plantation, dk. Caddo Central Oil & Ref. Co.'s Nos. 4 Pugh, 13-12-11, to pump 2730 ft; 5 Pugh, dk; 6 Pugh, lcn. Central Coast Oil Co.'s No. 3 Nelson, 6-12-10, dr 750 ft. Commonwealth Pet. Co.'s No. 1 Holly, 9-11-9, rigged. Continental Asphalt & Pet. Co.'s Nos. 1 Ardis, 1-12-11, dk; 1 Nelson, 32-13-10, set 6-inch 2530 ft; 42 Nelson, dr 2550 ft; 43 Nelson, to pump 2790 ft; 44 Nelson, dk; 46 Nelson, lcn; A-4 Robinson, 36-13-11, lcn; A-5 Robinson, sd 2930 ft; A-6 Robinson, dk; A-7 Robinson, tested sw, sd 2820 ft; A-8 Robinson, dk; A-9 Robinson, fsh 1730 ft; A-13 Robinson, 32-13-10, dr 2810 ft; A-14 Robinson, lcn; B-15 Robinson, dk; B-17 Robinson, rigged; B-18 Robinson, fsh 1820 ft; F-4 Robinson, dk.

Depositors Oil Co.'s Nos. 24, 25, 26, 27 and 28 Polly, 6-12-10, dks; 33 Polly, 7-12-10, to pump 2780 ft; H-2 Robinson, dr 300 ft. Doan Oil Co.'s Nos. 4 Nelson, 6-12-10, to pump 2820 ft; 12 Nelson, set 6-inch 2540 ft. Dominion Oil Co.'s Nos. 4 Nelson, 6-12-10, lcn; 6 Nelson, sw and some oil, 2810 ft.

Empire Gas & Fuel Co.'s No. 1 Howard, 27-13-10, fsh 1640 ft.

Fair Oil Co.'s No. 1 Armistead, 20-13-10, dry, to dr deeper 2565 ft. Fortuna Oil Co.'s Nos. 6 Pugh, 13-12-10, lcn; 8 Pugh, 7-12-10, dk; 24 Pugh, 6-12-10, dry, sd 2850 ft; 25 Pugh, to test 2770 ft; 28 Pugh, 12-12-10, dr 350 ft; 32 Pugh, 12-12-10, to pump 2750 ft; 36 Pugh, 6-12-10, setting liner 2910 ft; 37 Pugh, 12-12-11, to pump 2710 ft; 39 Pugh, 6-12-10, dr 1200 ft; 40 Pugh, 12-12-11, bailing 2710 ft; 41 and 42 Pugh, 12-12-11, dks; 43 and 44 Pugh, 7-12-10, dks. Frederick Oil Co.'s No. 1 Wilkinson, 3-12-10, dk. Foursome Oil Co.'s Nos. 8 Polly, 7-12-10, dk; 9 Polly, dk; 10 and 11 Polly, dks down; 12 Polly, to pump 2740 ft.

Garrison Coal & Oil Co.'s No. 1 O'Neal, 2-12-11, sw, sd 2830 ft. Gilliland Oil Co.'s Nos. A-3 Nelson, 32-13-10, dk; A-4 Nelson, sd 2540 ft; A-7 Nelson, dk; A-8 Nelson, dk. Giles & Herring's No. 1 Brinkerhoff, 31-13-10, to pump 2850 ft. Gulf Ref. Co.'s Nos. 16 Christopher, 16-13-10, dr 2600 ft; 11 Gray & Hook, 5-12-10, dk; 14 Gray & Hook, dk; 22 Kennedy, 23-13-11, set 6-inch 2410 ft.

Heard Oil & Gas Co.'s No. 1 Jackson, 28-12-10, sd 2900 ft. Homer 23 Oil Co.'s No. 1 Vascoca, 12-11-9, sd 500 ft.

Loggy Bayou Oil Co.'s No. 1 Welsh, 11-14-11, dr 1500 ft.

Moorefield et al's No. 1 Hollingsworth, 8-12-10, to pump 2740 ft. Municipal Oil Co.'s No. 1 Carroll, 29-13-10, bailing 2020 ft.

R. A. Nelson's No. 4 Nelson, 31-13-10, sd 2860 ft. North La. Drilling & Dev. Co.'s No. 1 Carroll, 30-13-10, sd 350 ft.

Producers Dev. Co.'s No. 1 Posey, 36-13-10, dr 1700 ft.

Ramey et al's No. 1 Robinson, 2-12-11, sd 2970 ft. Red River-Coushatta Oil Co.'s No. 1 Pylant, 32-13-9, lcn. Richardson Pet. Co.'s No. 1 Nelson, 26-13-11, lumber on lcn.

Schaffer Oil & Ref. Co.'s Nos. 7 Ardis, 1-12-11, sd 2840 ft; 6 Robinson, 8-12-10, sd 390 ft; 10 Robinson, sd 220 ft; 11 Robinson, fsh 2345 ft. Sinclair Oil Co.'s No. 1 Bidenhorn, 4-12-10, sd 2765 ft; 2 Bidenhorn, dr 400 ft; 2 Clarkson, 17-12-10, dk; 3 Clarkson, lcn; A-7 Nelson, 8-10-12, dk; A-8 Nelson, lcn; A-9 Nelson, dk; A-11 Nelson, lcn; C-1 Nelson, lcn; C-2 Nelson, to pump 2840 ft; 6 Polley, 7-12-10, bailing 2770 ft. Standard Oil Co.'s No. 34-A Palmer, 16-13-10, bailing 2550 ft. Strange Oil & Ref. Co.'s Nos. 3 Boylston, 8-10-12, junk in hole 2770 ft; 1 Chaffraix, 3-12-10, dk; 9 Nelson, 8-12-10, sd 990 ft; 10 Nelson, to pump 2760 ft; 12 Nelson, dk down; 13 Nelson, dk; 1 Smith Williams, 9-12-10, dr out plug 2530 ft. Sun Co.'s No. 7 Nelson, 6-12-10, rigged.

Tarver Oil Co.'s No. 1 O'Neal, 2-12-11, dk. The Texas Co.'s No. 1 Schaffer, 16-12-11, dr 1700 ft. Texas Ranger Oil Co.'s Nos. 2 Robinson, 32-13-10, dk; 4 Robinson, setting liner 2800 ft; 5 Robinson, rigged. Transcontinental Oil & Gas Co.'s No. 3 Clarkson, 17-12-10, dk.

Woodley et al's Nos. 2 Lockett, 29-13-10, sd 2845 ft; 3 Lockett, set 6-inch 2575 ft; 4 Lockett, set 6-inch 2560 ft; 5 Lockett, dk; 2 Armistead, 29-13-10, lcn; B-1 Lockett, set packer, testing 2020 ft.

New Oil Field in Eastern Wyoming

The Mule Creek oil field is in eastern Wyoming, only four miles from the South Dakota line, about 35 miles northeast of the well-known Lance Creek field and 100 miles east of the Salt Creek field, the most productive field in Wyoming. The presence of petroleum in commercial quantities in this region had long been suspected, and in recent years considerable drilling had been done on a prominent anticline there, but most of it was done to validate claims, and though many "shows" of oil were reported, the wells were not sunk deep enough to test the anticline thoroughly. In 1919 the geologists of the Ohio Oil Company discovered a second anticline southeast of the prominent anticline to which drilling had been confined, and the company drilled on this southeastern anticline a test well that proved to be the discovery well of the field.

The production of this first well was small compared with that of the wells in the nearby Lance Creek field, but its success stimulated extensive drilling, and by the fall of 1919 about 10 wells on the southeastern anticline were each producing daily 125 to 150 barrels of oil of high grade. Drilling was not confined to the southeastern anticline, however, but late in 1919 no large quantity of oil had been found except in wells drilled near its axis.

Oil may perhaps be obtained from the western Mule Creek anticline. Many of the wells drilled there did not reach the Lakota sandstone, of Cretaceous age, from which the oil in the other anticline is drawn, and, although some wells on the western anticline have penetrated this sandstone without finding commercial quantities of oil, there may be other places on it that will repay drilling. The possibly productive beds, however, are not restricted to the Lakota sandstone, for at least one other deeper bed—the Minnelusa sandstone, of Carboniferous age—should be tested before the anticline can be condemned as nonproductive. Oil has been found in the Minnelusa sandstone in a well drilled on the Old Woman anticline, only 15 miles southwest of the Mule Creek field, as well as in the Rocky Ford field, in Crook County, Wyoming, to the north. This sandstone should be encountered in the Mule Creek field about 1300 feet below the productive sandstone of the southeastern anticline. As the productive sandstone is about 1400 feet below the surface in the discovery well, the deeper sandstone does not lie too deep for drilling. The Minnelusa sandstone lies about 600 feet nearer the surface on the western anticline than on the eastern, so a well drilled on the apex of this anticline should reach the top of this sand at a depth of 2100 feet. As the Minnelusa sandstone is probably 800 feet or more thick, however, the drill should be carried considerably deeper in order to test the formation adequately.

The Mule Creek oil field is described in a report by E. T. Hancock just published by the United States Geological Survey free of charge from The Director, U. S. Geological Survey, Washington, D. C.

WILDCATS FROM ALL SECTIONS

North Texas Wildcats

WILDCAT COMPLETIONS

Archer County — Checkerboard Leasing Syndicate's No. 1 Fore, abn 2000 ft. James Dowe et al's No. 1 Dale, abn 1200 ft. Silk et al's No. 1 Scott, abn 5000 ft. Staley Oil & Gas Co.'s No. 1 Browning, abn 2120 ft.

Clay County—Sanders & Ramming's No. 1 Godfrey, abn 2000 ft.

Petrolia District—Lone Star Gas Co.'s No. 9 Stein, junked 1640 ft.

Young County—Southwestern Miami Oil & Dev. Co.'s No. 1 McKeen, 100 bbls oil and 4,000,000 cubic feet of gas, 4010 ft.

Mississippi Wildcats

ATTALA COUNTY—Choctaw Oil Co.'s No. 1 Herring, 14-14-7E, dk.

CLAY COUNTY—Gulf Dev. Co.'s No. 1 McLain, 23-17-17, lbr on lcn.

HINDS COUNTY—Raymond & Benninger's No. 1 Elton Plantation, 6-4-1E, sd 1390 ft.

JACKSON COUNTY—Georgia Co.'s No. 1 Waterman, 4-6-5W, sd 1990 ft. Great American Oil Co.'s No. 1 Fee, 36-7-5W, lcn. Sea Coast Oil Co.'s No. 1 Danzell, 22-7-6, set 8 inch 2390 ft. Worth & Pitts' No. 1 School Land, 16-6-5, lcn. Mrs. Drenner et al's No. 1 Money, 12-7-9W, dk.

LAUERDALE COUNTY—Geo. Baird & Co.'s No. 1 Craig, 28-7-14, rigged.

LINCOLN COUNTY—Lincoln County Oil & Gas Co.'s No. 1 Burr, 8-7-7, dk.

LOWNDES COUNTY—Tombigbee Oil & Gas Co.'s No. 1 Hardy, 9-19-17, sd 475 ft.

MADISON COUNTY—Geo. Baird & Co.'s No. 1 Graves, 9-8-1E, rigged.

MONTGOMERY COUNTY—Preston Oil & Gas Co.'s No. 1 McLean, 15-19-6, dr 300 ft.

PIKE COUNTY—Gulf Drilling Co.'s No. 1 Cupit, 25-2-7E, rigged up.

TALLAHATCHIE COUNTY—Charleston Oil & Gas Co.'s No. 1 Newton, 36-25-2E, dr 2900 ft.

WARREN COUNTY—Edwards Oil & Ref. Co.'s No. 1 Archer, 35-9-5, dk.

Florida Wildcats

LEON COUNTY—Central Florida Oil Co.'s No. 1 Rhodes, 3-2-1, rigged up.

WASHINGTON COUNTY—Chipley Oil Co.'s No. 1 Dekle, 27-4-13, setting 6 inch 3590 ft.

WAKULLA COUNTY—Bonheur Dev. Co.'s No. 2 Fee, 16-3-1E, sd 1490 ft.

Arkansas Wildcats

COLUMBIA COUNTY—Ark-Tex. Oil Co.'s Nos. 1 Davis, 13-17-23, dk. Oklahoma Pet. Co.'s Nos. 1 Walker, 17-19-21, sd 1390 ft; 1 Waller, 6-19-20, sd 1560 ft. South Arkansas Oil & Gas Co.'s No. 1 Crisp, 36-17-20, set 8 inch 1680 ft. Texolean Oil Co.'s No. 1 Lockett, 2-17-19, dr 2825 ft.

LAFAYETTE COUNTY—Ark-Tex. Oil Co.'s No. 1 Buchanan & Cornelius, 17-17-23, sd 1270 ft. S. S. Hunter's No. 1 Rennick, 36-16-25, dk. Lafayette Oil & Gas Co.'s No. 1 Creek, 10-15-24, dk.

MILLER COUNTY—Central Coast Oil Co.'s No. 1 Mann Land & Improvement Co., 22-15-26, sd 1170 ft. Farmers Oil & Ref. Co.'s No. 1 Ramsey, 24-17-27, dk. Welsh Oil & Gas Co.'s No. 1 Steed, 19-18-26, dr 1850 ft.

NEVADA COUNTY—Merritt Oil & Ref. Co.'s No. 1 Barlow, 16-12-20, rigged rotary 490 ft. Strayhan & Crawford's Nos. 1 Andrews, 4-13-20, lcn; 1 Starnes, 12-12-20, lcn.

OUACHITA COUNTY—Humphrey Oil Co.'s No. 1 Boyd, 23-12-19, fsh 2930 ft. S. S. Hunter's No. 1 Wesson, 24-15-18, dr 2425 ft. Louisiana Oil & Ref. Corp.'s Nos. A-1 Allen, 13-15-19, dk; B-1 Allen, 18-15-18, dr 2500 ft. Trans-Continental Oil Co.'s No. 1 Lester & Halton, 13-15-19, set 6 inch 2000 ft. Strayhan & Crawfords No. 1 Garnett, 15-12-18, set 4½ inch 3200 ft. Standard Oil Co.'s No. 2 Lester & Haltom, 18-15-18, set 4½ inch 2430 ft.

UNION COUNTY—E. M. Brown's Nos. 1 Grace, 3-18-14, set 16 inch 2140 ft; 1 Goodwin, 16-16-14, dr 1300 ft. Congress Oil Co.'s No. 1 Swilley, 8-19-15, sd 2360 ft. Constantine Oil & Ref. Co.'s No. 2 Parnell, 12-18-16, dr 1400 ft. Forrest Oil Co.'s No. 1 Mayfield, 21-18-17, dr 2850 ft. Mattix & Hinton's No. 1 Armstrong, 31-17-15, sd 2010 ft. Quaker City Pet. Co.'s No. 1 Mittendorff, 15-17-15, dr 2700 ft. Trinity Pet. Co.'s No. 1 Realty Colonization Co., 21-18-15, sd 3210 ft. Union Pet. Co.'s No. 1 Helm, sd 190 ft. Walker et al's No. 1 Flournoy, 5-17-17, sw, sd 2680 ft.

WHITE COUNTY—La Oil & Ref. Corp.'s No. 1 Meyer, 28-8-6, sd 820 ft.

BRADLEY COUNTY—Caldwell Oil Co.'s No. 1 So. Lbr. Co., 9-16-12, dr 3025 ft; 2 So. Lbr. Co., 18-11-11, dr 500 ft. Standard Oil Co.'s No. 1 So. Lbr. Co., 6-16-9, dr 1350 ft.

CALHOUN COUNTY—Arkansas Natural Gas Co.'s No. 1 Childress, 1-15-15, dr 2100 ft.

CLEVELAND COUNTY—Combination Oil Co.'s No. 1 Lipton, 8-11-11, sd 780 ft. Elliott et al's No. 1 Tolson, 34-8-10, dk.

500 Barrel Well Completed in Palo Pinto County at 1580 Feet

DALLAS, TEXAS, Oct. 20.—The Texas & Pacific Coal & Oil Company's No. 35 on the Stuart tract in Palo Pinto County was completed last week with an initial production of 500 barrels. This well is only a short distance from the Stephens County line, and is said to be the largest producer brought in on the Stuart tract. It came in natural at 1588 feet.

In Brown County, Williamson & Williamson's No. 1 Cox is making 50 barrels oil and 2,000,000 feet gas at 2401 feet.

The Gladys Bell Oil Company's No. 6 Pope, in Coleman County, is showing some oil at 1580 feet, while the same company's No. 3 Campbell has been completed with a daily production of 15 barrels oil at 1582 feet.

In Runnels County, Nelson and Nelson's No. 1 Mary Spreen has been abandoned at 600 feet.

The Colorado-Texas Petroleum Company's well in Mitchell County is bailing oil at a depth of 2630 feet. This well is an offset to the Underwriters Producing & Refining Company's No. 1 T. & P. Land, which was completed two weeks ago with an initial production of 25 barrels at 2480 feet.

San Antonio District Wildcats

ARANSAS COUNTY—Rockport Oil & Gas Co.'s No. 2 St. Joseph's Island, Rockport, sd 1200 ft, repairing boiler damaged by salt. (Corrected report and depth.)

ATASCOSA COUNTY—American Texas Oil Co.'s No. 3 Fowler, Touchstone Johnson, dr 1024 ft in rock. Compton Oil & Gas Co.'s No. 1 Campbell, northeast corner survey 198, 7 miles northeast Campbellton, dr; 2 Baker, north center survey 125, building dk. Edna Oil & Dev. Co.'s No. 1 S. Jourdanton, dr. Kribs et al's No. 1 Vicks, 14 miles southwest San Antonio, dr 520 ft.

BANDERA COUNTY—Rex Oil Co.'s No. 1 Adameitz, northwest corner survey 24, N. G. de los Santos, 3 miles east Bandera, sd. Wood-Texas Oil Co.'s No. 1 Clayton, northeast corner survey 902, M. & D. Vanderpool, dr. (No report on depth.)

BEXAR COUNTY—Ennis Operating Co.'s No. 1 St. Clair, 9 miles east San Antonio, Gonzales road, spudded in. Guaranty Oil & Ref. Co.'s No. 1 Stanush, 14 miles east San Antonio, St. Hedgwig road, setting casing 300 ft. Park Oil & Gas Co.'s No. 1 Toudlouse, dr 1750 ft. Reynolds et al's No. 1 M. Yturri, 10 miles south San Antonio, Corpus Christi road, to resume dr 1200 ft. Ulf Varnes Exploration Co.'s No. 1 Lamm, 9 miles southwest San Antonio, Corpus Christi Road, sd. Williamson-La Fortune Oil Co.'s Nos. 1 Binz, 11 miles east San Antonio, sd; 2 Williamson, dr 300 ft.

CALDWELL COUNTY—Hamilton & Walker's No. 1 Ohlendorf, Harrison Survey, 6 miles northwest Lockhart, sd.

DUVAL COUNTY—Abercrombie et al's No. 1 Ruiz sd. Gray Ridge Oil Co.'s No. 1 Gray, survey 322, 15 miles northwest San Diego, dr 1225 ft, set 12½ inch casing. Holliday Hook and Causey's No. 1 Altimira, Ysidro Garcia, sd 1200 ft. Scallert et al's No. 2 National, northwest Benavides, sd 1316 ft. Martex Oil Co.'s Nos. 1 Ridder, survey. 4, sd 3585 ft; 2 Ridder, dr 1740 ft in shale. Simms Oil Co.'s No. 1 Singer, dr 450 ft. Textler Oil Co.'s No. 1 Clark, Vaello, sd.

EDWARDS COUNTY—Transcontinental Oil Co.'s No. 2 Peterson, sd. Empire Gas & Fuel Co.'s No. 1 Rust, section 11 Block 2, sd 700 ft.

GOLIAD COUNTY—Texcal Oil Co.'s No. 1 Eckhardt, dr 2000 ft. Earltex Oil Co.'s No. 1 Maetze, 2 miles northeast Goliad, dr. Goliad Oil Co.'s No. 1, 9 miles west Goliad, south San Antonio River, gassing too heavy to work. Waiting on material to control gas. Goliad Northern Oil Co.'s No. 1 Danforth, dr. Goliad-Midway Oil Co.'s No. 1 Locust, 10 miles south Goliad sd 600 ft.

HIDALGO COUNTY—La Lomita Oil Synd.'s No. 1 Oblate Fathers, sd. Dayle L. Smith Oil Co.'s Nos. 1 Daskam, preparing to sidetrack at 2356 ft; 1 Fernandez, testing 1170. (Reported oil showing.) 1 Flores, dr 500 ft; 1 Vela, rigging up.

KLEBERG COUNTY—Texas Kentucky Oil Co.'s No. Fee, setting 8 inch, 2100 feet in shale and gumbo. Cap Rock Oil Ass'n's No. 1 Holkemper, 6 miles southeast of Kingsville, set 8 inch at 2100 feet in blue gumbo. Kleberg County Oil & Gas Co.'s No. 3 Rosse Farm, 6½ miles southeast of Kingsville, lost shoe at 875 feet, cemented and went through it with standard tools, now drilling at 1150 ft.

KARNES COUNTY—Atlasta Oil Co.'s No. 1 Porter, 7 miles south Runge, setting 8 inch casing, 1900 ft.

KERR COUNTY—Shaw et al's No. 1 Spicer, dr 1180 ft.

LIVE OAK COUNTY—Hawley Ayers Co.'s No. 1 two miles south Fant City, completed water wells. Live Oak Basin Oil Co.'s No. 1 O'Docherty, sd 1000 ft. Ed Mattison et al's No. 1 Festus Doyle survey, 3 miles east Fant City, sd Witherspoon Oil Co.'s No. 1 Mahoney, 3 miles northwest Three Rivers, setting 8 inch casing.

MAVERICK COUNTY—Completed Oil Co.'s No. 1 Gus Black, dr 2140 ft in shale. International Oil & Fuel Co.'s No. 1 De Bona, Eagle Pass, dr 1200 ft. Storm et al's No. 1, 8 miles northeast Crystal City, sd 1400 ft.

WILSON COUNTY—Southern Pacific Oil Co.'s No. 1 Griffin, dr 950 ft. Alum Creek Oil Co.'s No. 3 Wagner, Lavernia, resumed dr after testing for production at 1600 ft. (Expects better production within 500 feet from log of Nos. 1 and 2.

Coastal Wildcats

Houston, Texas, Oct. 20.—The feature of the wildcats of the Gulf Coast district during the past week was the establishment of the Gulf Production Co.'s No. 1 Kishi Lang, as a steady producer in Orange County. The well is flowing around 250 barrels of pipe line oil through a three inch liner. The Gulf has made a location for B-2 Kishi Lang, located 500 feet east of the No. 1 well. The completion of this well has stimulated interest in Orange and other companies are making locations. The drilling report of Orange County will be found in the regular report below. Two tests were made in the Coastal Wildcats during the past week but both proved unsuccessful.

BRAZORIA COUNTY—Freeport Sulphur Co.'s Nos. 1 Guy Bryan, dr 2475 ft; 7 Dannenbaum, set casing 2090 ft; dr ahead; 1 Pool, dr 3315 ft. Humble Oil & Ref. Co.'s Nos. B-3 Seaburn, dr 2600 ft; 1 Shea Storrie, rig up, preparing to drill. Brazoria County Oil & Mineral Co.'s No. 1 Acton, dr 2680 ft. Jones-Smith's No. 1 Brazos Valley Plantation, dr 500 ft. The Texas Co.'s No. 2 Cochran & McClure, side-tracking dr stem, 3061 ft. Rancho Isabella Oil Co.'s No. 1 Warner, dr 2250 ft.

BRAZOS COUNTY—Wickson Lake Oil Co.'s No. 1 Tabor has changed hands and is now William Wakefield's No. 1 Tabor. It is a derrick.

COLORADO COUNTY—Ellinger Gonzales Oil Co.'s No. 1 Plengemeyer, sd 620 ft.

GRIMES COUNTY—Kle-Tex Synd.'s No. 1 Kelly, sd 2357 ft. Empire Gas & Fuel Co.'s No. 1 F. M. Davis, farm, rig up.

HARRIS COUNTY—Texas Ex. Co.'s Nos. 1 Settegast Heirs, dr 2310 ft; 1 Ritter, set joint of 4 inch screen at 2474 ft, bailed unsuccessfully, dr ahead at 2500 ft; 2 Warren, dr 2675 ft; 3 Warren, sd 2175, crew on No. 3 for double shift; 4 Settegast, dr 1850 ft. Gulf Prod. Co.'s No. 2 Kirby, dr 2280 ft; 2 Taylor, Pierce Junction, dr 500 ft. Simms Oil Co.'s No. 1 Kirby tract, dr 3400 ft. J. D. Hales No. 3 Wilkerson, dr 1300 ft. R. E. Brooks, Jr.'s No. 1 Quenzall, dr 2975 ft. Drummitt et al's No. 1 Maury, sd 1500 ft. Cedar Bayou Oil & Ref. Co.'s No. 1 Wilson, around 2075 ft.

JACKSON COUNTY—Texas Oil Producers Co.'s No. 1 Mitchell, dr 1100 ft. Jackson County Oil Synd.'s Nos. 1 Fuqua, dr 1650 ft; 2 Drushell, dr 1475 ft.

LIBERTY COUNTY—E. F. Simms & Co.'s No. 5 Pruitt, set 6 inch, 3750 ft, dr ahead 3825 ft. Liberty County Oil Co.'s No. 2 Gilbert, rig on grounds. Chance To Loose Oil Co.'s No. 2 Ferguson, waiting on surface casing before starting. Humble Oil & Ref. Co.'s No. 4 Hume, Davis Hill, dr 900 ft; 10 McCardle, Davis Hill, spudded in; 1 Cherry, set casing on cap rock at 1320 ft, bailed open hole, showed sw.

ORANGE COUNTY—Gulf Prod. Co.'s No. 2-B Kishi Lang, lcn. Humble Oil & Ref. Co.'s No. 1 Kishi, dr 2890 ft; 1 Ship Builders, dr 3520 ft. Toals' Oil & Dr. Co.'s No. 1 Winfrey, sd 1875 ft. Cross Streams Oil Co.'s No. 1 Chambers, around 2500 ft. Elinore Oil Co.'s No. 1 Mary Williams, sd 2830 ft.

WALLER COUNTY—Dome Oil Co.'s No. 1 Carter, side-tracked at 700 ft, dr ahead.

WHARTON COUNTY—Banderett Oil Co.'s No. 1 Wilbeck Farm, sd 1800 ft, impossible fsh job.

Northeast Texas Wildcats

NORTHEAST TEXAS WILDCAT COMPLETIONS

Harrison County—Gulf Production Co.'s No. 1 Banks Boogery, blew out 750,000 cubic feet of gas and spray of salt water, abandoned 3000 feet.

Panola County—Texas Co.'s No. A-2 Adams, blew out, estimated 50,000,000 cubic feet of gas and trying to put on connections, 2670 feet.

BOWIE COUNTY—Dolby Springs Oil Co.'s No. 1 Bowie, County School Land, sd. Postal Clerks Oil & Gas Co.'s No. 1 Fee, sd 2840 ft. Tex-Port Oil & Gas Co.'s Nos. 1 Gilly, testing 3170 ft; 1 Golson, set 8 inch 1290 ft.

CASS COUNTY—Carlson Price Pet. Co.'s No. 2 Spears, sd 1750 ft. Gladys-Belle Oil Co.'s No. 1 Lister, dr 2600 ft.

FANNIN COUNTY—Telephone Oil & Gas Co.'s No. 1 Moore, fsh 1720 ft.

HARRISON COUNTY—Amarillo Caddo Oil Co.'s No. 1 Boyd, fsh 2500 ft. Bruner Petroleum Co.'s No. 1 Lowery, sd 2910 ft. Gulf Prod. Co.'s No. 1 L. S. Smith, dk. R. W. Hale, et al's No. 1 Harris dr, 2525 ft. Kentucky Investment Co.'s No. 1 Waldron, sd 290 ft. Sinclair Oil Co.'s No. 1 Guynn, fsh 3085 ft. Texas-Caddo Oil & Gas Co.'s No. 1 Currie, dr 2525 ft. Texland Oil Co.'s No. 1 State, sd 2800 ft. Snelling et al's No. 1 State, rigged to dr. Universal Pet. Co.'s No. 1 Bivens, sd 2090 ft.

HOPKINS COUNTY—Deering & Green's No. 1 Attaway, dr 750 ft. Gatex Oil Co.'s No. 1 Davis, sd 1690 ft. Nunn & McMann's No. 1 Smith, dk. G. W. Stough's Nos. 1 Smith, sd 1590 ft; 1 Mitchell, dk. Southwestern Oil Fields Co.'s No. 1 sd 940 ft.

LAMAR COUNTY—Auds Creek Oil Co.'s No. 1 Hampton, sd 1930 ft. Blossom Oil & Dev. Co.'s No. 1 Lenoir, sd 1130 ft. Lawrence Drilling Co.'s No. 1 Womack, dr 2100 ft. Maurice Burton, Trustee's No. 1 Berry, dr 1900 ft. North Mid-Texas Oil & Gas Ass'n's No. 1 Barr, sd. Tri-Sands Oil & Dev. Co.'s No. 1 Ford, sd 100 ft.

MARION COUNTY—Hewitt Caddo Mineral & Realty Co.'s No. 1 Crawford, sd 2320 ft. Hollister Oil Co.'s No. 1 Loomis, dk. Sun Co.'s No. 131 Harrell, to pump 2360 ft.

MORRIS COUNTY—Merzier Oil Co.'s No. 1 McDonald, dr 2400 ft.

NACOGDOCHES COUNTY—McCreary & Ramsey's No. 1 Strode, dr 950 ft.

PANOLA COUNTY—Bethany Oil & Gas Co.'s No. 202 A. Jernigan, sd 2465 ft. Bethany Oil & Gas Co.'s Nos. 201 Johnson, testing gas 2925 ft.; 305 Sexton Caldwell, sd 1870 ft. Clarksdale Oil & Gas Co.'s No. 1 Arnold, fsh 2610 ft. Gulf Prod. Co.'s Nos. 3 Agurs, dk; 2 B. Louis Werner, dr 2520 ft; 3 B. Louis Werner, set 8 inch 1220 ft. Hope Oil Co.'s No. 3 Louis Werner, sd 1420 ft. Humble Oil Co.'s No. 1 Christian, dr 1750 ft. Mutual Oil Co.'s No. 1 Lawson, lcn. Magnolia Pet. Co.'s No. 1 Steel, fsh 1875 ft. The Texas Co.'s Nos. A-2 Adams, blow out 45,000,000 cu ft gas 2665 ft.; 9 Waterman Lbr. Co., no crew, 2090 ft.

RED RIVER COUNTY—Avery Pet. Co.'s No. 3 Bearden, rigging to dr. Ranger Valley Oil Co.'s No. 1 Puckett, dk. Toronto-Texas Oil & Gas Co.'s No. 1 Coleman, fsh 1090 ft.

RUSH COUNTY—Big State Oil Co.'s No. 1 Wright, sd 3550 ft. Pure Oil Co. No. 1. lcn. Sinclair Oil & Gas Co.'s No. 1 Bosworth, set 6 inch 3030 ft.

SHELBY COUNTY—Cathcart Texas Oil Co.'s No. 1 Holt, dk. Eysenback et al's No. 1 Brown, sd 2040 ft. Lane Oil Co.'s No. 1 Hughes, dr 3150 ft. Polly Oil & Gas Ass'n's No. 1 Jones, lcn. The Texas Co.'s Nos. 1 Hunt, side-tracking 3000 ft; 13 Pickering, dr 2425 ft; 14 Pickering, dr 350 ft.

SMITH COUNTY—Brooks Saline Oil & Gas Co.'s No. 5 Woldert, rigging to dr. Lindale Oil Co.'s No. 1 Whitter, fsh 2620 ft. Nac-Tex. Oil Co.'s No. 1 Gary, rigging to dr. Sinclair Oil Co.'s No. 1 Brooks, dr 900 ft. Younglove et al's No. 1 Sykes, dk.

TITUS COUNTY—Stinking Creek Oil & Gas Co.'s No. 1 Davis, sd 840 ft. Wester et al's No. 1 Scott, sd 130 ft.

UPSHUR COUNTY—Davis & Younger's No. 1 Minor, fsh 2100 ft.

VAN ZANDT COUNTY—Van Zandt Oil & Gas Co.'s No. 1 Jones, sd 390 ft.

WOOD COUNTY—Carter et al's No. 1 Clark, dr 1000 ft. Simpson Oil Co.'s No. 1 Owens, sd 2740 ft. B. W. Williams et al's Nos. 1 Thompson, rigging to dr; 1 Adrian, dk.

North Louisiana Wildcats

ALLEN PARISH—Kribs & Mountz's No. 1 LeBlance, 1-6-6, sd 2270 ft.

ARCADIA PARISH—Gulf Ref. Co.'s Nos. 32 Clement, dr 1650 ft; 4 Martin, dk.

ASSUMPTION PARISH—Pierre Peart Oil Co.'s No. 1 Pierre Peart Island, 3-12-12, rigged.

AVOYELLESS PARISH—Simms Oil Co.'s No. 1 Bordelon, 25-2-4E, dr 1950 ft.

BEAUREGARD PARISH—Perkins Oil Co.'s No. 1 Perkins, 24-7-10, dr 3200 ft.

BIENVILLE PARISH—Arcadia Oil Co.'s No. 1 Anderson, 29-18-5, sd 2290 ft; 1 Pentecost, 21-18-5, dk. Cotton Oil Co.'s No. 1 Jones, 9-17-6, dr 2710 ft. Congress Oil Co.'s No. 1 Davis, 31-17-5, sd 2280 ft. Walter Dickinson et al's No. 1 Fuller, 6-16-7, sd 1890 ft. Early Oil Co.'s Nos. 1 Baker, 9-17-7, dk; 1 Thurman, 35-18-7, dr 2200 ft. Harmony Oil Co.'s No. 1 Hodges Lumber Co. 16-15-4, lost hole, moving over. Humble Oil & Ref. Co.'s No. 1 Poole, 9-16-6, to test 2960 ft. Louisiana Oil Ref. Corp.'s No. 1 Huckaby, 27-15-8, fsh 2290 ft. Phillips Pet. Co.'s No. 1 Briceland Lumber Co., 2-16-7, sd 2710 ft. A. C. Scott's No. 1 Evans, 32-16-8, sd 1990 ft. Superior Oil & Gas Co.'s No. 1 Jordan, 30-16-3, sd 2250 ft. Venture Oil Co.'s No. 1 Lawhorn, 15-16-8, dr 2275 ft.

BOSSIER PARISH—Arkansas Natural Gas Co.'s No. 124 Bush, 8-16-11, dk; 147 Prince, 30-16-11, dr 1250 ft. Bossieau et al's Nos. 1 Fullilove, 21-19-13, sd 2600 ft; 3 Fullilove, dry, sd 2610 ft. Caddo Central Oil & Ref. Co.'s No. 1 Fee, 23-21-13, dr 1750 ft. Gulf Refining Co.'s Nos. 9 Hodges, 24-16-12, to pump 1550 ft; 4 Leviston, rigged. Homer Union Oil Co.'s No. 1 Scott, 35-19-13, r to bottom 2550 ft. Hodges Oil Co.'s Nos. 7 Marshall, 19-16-11, set 6 inch 1530 ft; 8 Marshall, dk. W. C. Kendall et al's No. 1 Prince, 32-17-12. Louisiana Gas & Fuel Co.'s Nos. 2 Bossier Live Stock Co., 10-16-11, set 6 inch 2550 ft; 3 Bossier Live Stock Co., 9-16-11, dr 2100 ft; 4 Hunter, 13-16-12, dr 1200 ft. Mountain & Gulf Oil Co.'s No. 1 Caldwell, 22-22-13, dr 3100 ft. Rocky Mount Oil Co.'s No. 1 Zeigler, 17-21-12, sd 2025 ft. R. O. Roy's No. 1 Smith, 7-19-11, dr 2150 ft. Standard Oil Co.'s Nos. 3 J. T. McDade, 31-16-11, dk; 3 A. F. McDade, 18-16-11, setting liner 2120 ft. Trans-Continental Oil & Gas Co.'s Nos. 1 Scovell & Gaines, 10-22-13, dry 2660 ft; 1 Thigpen & Herold, 15-20-13, set 8 inch 1770 ft. Texas Co.'s No. 3 Dowdell, 31-16-11, dr 2400 ft.

CALDWELL PARISH—White Eagle Pet. Co.'s No. 1 Burroughs, 26-12-5E, moving in rig. Trans-Continental Oil Co.'s Nos. 1 Burroughs, 1-18-5E, set 8 inch 2320 ft; 1 La. Central Lbr. Co., 19-13-4E, setting 8 inch 2000 ft.

CALCASIEU PARISH—Avery et al's No. 1 S. S. Hunter, 21-9-11, dk. Barrett & Co.'s No. 1 Perry, 24-12-10, partly rigged. Edgerly Pet. Co.'s No. 2 Drew, 29-9-11, dr 650 ft. Emmerson & Noble's No. 1 Hunter, 21-9-11, side-tracking 2830 ft. Gulf Ref. Co.'s Nos. 34 Bright Penn, 28-9-11, setting 6 inch 3000 ft; 53 G. N. Gray, 33-10-12, side-tracking 2160 ft; 21 Star Vincent, 34-10-12, dr 2300 ft. Baysomoe Oil Co.'s No. 1 Ogea, 27-10-9, sd 3180 ft. Highmount Oil Co.'s No. 1 Roderick, 29-9-12, sd 3050 ft. Great Sou Pet. Co.'s No. 1 Muller, 29-9-11, sd 3000 ft. Mars & McLean's No. 5 F. H. Gray, 33-10-12, sd 590 ft. Dr. Monroe & Co.'s No. 1 Hastie, 16-10-11, rigged up Rescue Oil Co.'s No. 8 Gray, 4-11-12, dk. Sure Shot Oil Co.'s No. 1 Frazier, 14-9-8, dr 1450 ft. Vinton Pet. Co.'s No. 30 Gray, 33-10-12, blowout 1830 ft. Virginia Oil Co.'s No. 1 Landry, 2-11-12, lcn. White Oil Corp.'s No. 1 La Sulphur, 28-1-11, abn 3500 ft.

CATAHOULA PARISH—Rowe O'Donnell's No. 1 Causey, 13-10-7E, set 8 inch 1270 ft; 1 Cleisen, 5-10-8, dk.

CAMERON PARISH—Gulf Gardner & Nobles No. 1 Vincent, 30-12-10, rigged.

GRANT PARISH—American National Oil Co.'s No. 1 Swope, 18-9-1E, dk. Chatman et al's No. 1 Edenborn, 13-8-4, dk. Lyle et al's No. 1 Calhoun, 32-7-3, sd 2570 ft. Ray & Trammell's No. 1 Edenborn, 9-7-3, fsh 2470 ft.

JACKSON PARISH—Jackson Lincoln Oil Co.'s No. 1 Kavanaugh, 34-17-3, sd 1810 ft. Louisiana Oil & Gas Co.'s No. 1 Martin, 6-15-1W, sd 190 ft. Petroleum Co. of La.'s No. 1 Netherland, 28-15-2, dk. Phillips Pet. Co.'s No. 1 Boden, 24-17-8, sd 2700 ft. Whiteside et al's No. 1 Denman, 27-17-2, setting 4½ inch 3450 ft.

JEFF DAVIS PARISH—Carradine & Co.'s No. 1 Todd, 27-9-5, sd 1430 ft. Liberty Oil & Sulphur Co.'s No. 4 Welsh Land Co., 21-9-5, dk. McLaughlin Oil Co.'s No. 2 McLaughlin, 35-8-6, sd 2940 ft.

IBERVILLE PARISH—J. H. Barnes Oil Co.'s No. 1 Wilbert, 46-8-9, sd 480 ft.

LA FOURCHE PARISH—La Fourche Oil & Gas Co.'s No. 2 Fornet, 64-17-20, dr 1800 ft.

LA SALLE PARISH—Esterbrook & Rogers' No. 1 State, 25-6-3E, dr 3600 ft. Ray & Trammell's No. 1 Uramia Lumber Co., 29-11-2E, sd 2515 ft.

LINCOLN PARISH—Gladys Belle Oil Co.'s No. 1 Madden, 8-20-3, dk down, lcn abn. Newblock et al's No. 1 Davison, 26-19-3, sd 3508 ft. Ruston Oil & Pipe Co.'s No. 1 Carter, 12-18-3E, dk down, lcn abn. Tulsa Prod. Co.'s No. 1 Fuller, dk.

MOOREHOUSE PARISH—Bell Oil Co.'s No. 1 Rawlinson, 13-22-6E, r to bottom 2590 ft. Imperal Pet. Co.'s No. 2 Allison, 6-20-5E, sd 1220 ft; 3 Allison, dk. F. M. Madison's No. 1 Watson, 35-21-5, rigged. Southern Carbon Co.'s Nos. 6 Spyker, 9-20-5, dry 2340 ft; 3 Fee, 33-19-5E, rigged. The Texas Co.'s No. 2 Tensas Delta Land Co., 4-21-4, dr 600 ft. Transcontinental Oil Co.'s No. 1 Wayman Lumber Co., 1-18-5, to test 2190 ft. Ridge & McLaughlin's No. 1 Zachery, 21-23-8, fsh 2510 ft. Sterling Oil & Gas Co.'s No. 1 Freeland Odom, 20-21-5E, dr 2100 ft. United Oil & Gas Prod. Co.'s No. 1 Harris, 17-20-5, rigged.

NATCHITOCHES PARISH—Parks et al's Nos. 1

Clark & Morse Lumber Co., 23-5-6W, dk; 1 Crowell & Spencer Lumber Co., 59-5-6, dk. Harmony Oil Co.'s No. 1 Johnson, 22-6-5W, sd 2020 ft. Eugene Kelly's No. 1 Fitz, 12-10-10, dk. Planters Oil & Mineral Co.'s No. 1 Ayers, 3-13-7, fsh 2740 ft. Sedberry et al's No. 1 Mt. Creosote Land Co., 30-6-4, dr 400 ft. Tudar Oil Co.'s No. 1 Winn, 7-8-9, setting 6 inch 940 ft.

OUACHITA PARISH—Allen Oil Co.'s No. 1 Haynes, 36-18-2E, fsh 3990 ft. Alexander et al's No. 1 Eby & Austin, 51-18-3E, dr stem stuck 3890 ft. Bell Oil Co.'s No. 1 Brooks, 55-17-E, dk; 1 Rhymes, 22-17-4, setting 4½ inch 2410 ft; 1 Thomas, 24-18-4, dk. Florsheim et al's No. 2 W. Va. Lbr. Co., 4-18-5E, re4 setting liner 2350 ft. Hall Oil Co.'s No. 1 Richardson, 25-18-1E, dk. F. Hatcher et al's No. 1 Hatcher, 17-19-4, rigged. H. N. Huber's No. 2 Edwards, 1-18-4E, dk. Morris & Quiggs Nos. 1 Grayling, 20-17-3E, dr 300 ft; 1 Dixie Lbr. Co. 20-17-3E, dr 2700 ft. Southern Carbon Co.'s No. 2 Southern Carbon, 19-19-5, dk. Unit Leasing Co.'s Nos. 1 Schmidt, 35-16-3, lcn; 1 Daniel & Barnes, 22-21-7, dk.

RAPIDES PARISH—Alexandria Oil & Gas Co.'s No. 1 Ball, 41-4-3, dr 1825 ft. Big Ben Oil Co.'s Nos. 1 Ball, 39-5-3E, to test 1720 ft; 1 Blanchard, 38-5-3W, dr 1100 ft. Merryville Oil & Gas Co.'s No. 1 Tourney, 12-4-4W, dk W. D. Ball's No. 1 Barrett, 19-5-1W, dr 900 ft. S. J. Mountz's No. 1 Clark, 38-5-4, sd 2390 ft.

SABINE PARISH—Belmont Oil & Gas Co.'s No. 1 Skinner, 5-8-11, sd 2420 ft. Dominion Oil Co.'s No. 1 Russell, 16-8-13, set 6 inch 3150 ft. Garrett-Gandy's No. 1 Garrett-Gandy, 4-5-12, sd 2690 ft. Donnellau-Harris-Burkland Synd.'s No. 1 Sabine Lbr. Co., 26-9-12, dr 1650 ft. Pomeroy & Hamilton's No. 4 Louisiana Long Leaf Lumber Co., 17-6-12, set 6 inch 3600 ft. McCormick & Smith's No. 1 Stephens, 17-9-11, r to bottom 2160 ft. Simms Oil Co.'s No. 1 Logan, 22-10-12, dry 3340 ft, to dr deeper. Stubbs et al's No. 1 Anthony, 1-4-13, dk.

ST. LANDRY PARISH—McCormich & Smith's No. 1 Godchaux, 10-3-4E, sd 400 ft.

ST. MARTIN PARISH—Apex Oil Co.'s Nos. 2 Moreisie, 10-9-5, sd 1550 ft; 1 Bergeron, 9-5-9, dr 2200 ft. Canadian Oil & Gas Co.'s No. 1 Patout, 16-11-6, rigged. Bauners & Forman's Nat. Patin, 28-9-5, dk. Edgerly Pet. Co.'s No. 4 Martin, 15-9-5, dr 1400 ft. Blight & Co.'s No. 1 Martin, 5-9-5, dr 1200 ft. Interstate Oil & Gas Co.'s No. 1 Pourceaux, 23-9-5, sd 1280 ft. Oriental Oil & Gas Co.'s No. 1 Breaux, 23-9-5, sd 1280 ft. Shakespeare Oil Co.'s No. 1 Babb, 27-9-5, to pump 1560 ft. Southern States Oil Co.'s Bergeron, 9-9-5 dr 1250 ft.

TERRIBONNE PARISH—Ashland Plantation No. 1 Fees, 59-18-18, dr 1850 ft. Foundation Co.'s Nos. 1 Smith, 23-19-19, dr 500 ft; 5 Litrette, 33-19-19, set 4½ inch 2310 ft.

UNION PARISH—Conservative Oil Co.'s No. 1 Clark, 17-23-1E, dk. D'Abronne Lbr. & Oil Co.'s No. 1 D'Arbonne Lumber Co., 14-19-2E, moving over. Federal Pet. Co.'s No. 4 Union Saw Mill, 15-20-3E, r 2060 ft. Gladys Belle Oil Co.'s No. 1 Security Trust Co., 18-21-1E, sd 2500 ft. Petroleum Oil Corp. of America's No. 1 Cobb, 14-22-1E, lcn. Trans-Continental Oil & Gas Co.'s Nos. 1 Redden, 9-20-1W, sd 3410 ft; 1 Spencer, 2-20-3E, dk. The Texas Co.'s No. 1 Grayling Lumber Co., 29-12-4E, dr 1200 ft. Universal Petroleum Co.'s No. 1 Andrews, 28-22-4W, rigged.

VERNON PARISH—Delmer Oil Co.'s Nos. 1 Delta Land Co., 28-2-11, dr 1950 ft; 2 Delta Land Co., 17-1-9, sd 2200 ft. Fred I. Getty et al's No. 1 White Grandlin Lumber Co., 17-4-10, sd 2610 ft.

WEBSTER PARISH—American Oil Co.'s No. 1 Crichton, 26-19-10, sd 3240 ft. Banks Oil Co.'s No. 2 Fee, 25-22-9, sd 1790 ft. Castile Oil Co.'s No. 1 J. F. Giles, 28-23-11, sd 1690 ft. Eagle Pet. Co.'s No. 1 Warren, 12-22-9, dk. Kansas City Synd.'s No. 1 Walter, 8-17-9, to test 2050 ft, total depth 2890 ft. La-Miss Oil Co.'s No. 1 Denman, 1-22-11, dr 2100 ft. La. Oil Ref. Co.'s No. 1 Gleason, 15-22-10, setting 8 inch 1750 ft. Red Rock Pet. Co.'s No. 1 Haynes, 10-23-9, sd 1890 ft. Southwestern Gas & Electric Co.'s No. 1 Dickson, 16-20-9, dk. Gilbert Williams' No. 1 Woodward & Walker, 20-18-8, sd 280 ft.

WEST PELICAN PARISH—Como Oil Co.'s No. 1 Kiley, 41-15-3, sd 2100 ft.

WINN PARISH—Williams Cady's Nos. 1 Edenborn, 31-10-4W, fsh 1410 ft; 2 Edenborn, dr 1150 ft; 1 Southern Mineral Co., 19-11-3W, junked 1090 ft; 2 Southern Mineral Co., 24-11-4W, rigged.

Panhandle Wildcats

ARMSTRONG COUNTY—Goodnight Oil Co.'s No. 1 Goodnight, sd 2750 ft.

BRISCOE COUNTY—Cao Rock Oil Co.'s No. 1 Walker, dr 750 ft.

CARSON COUNTY—Capital Pet. Co.'s No. 1 Purvine, sd 3000 ft. Gulf Prod. Co.'s No. 2 Burnett, location. Humble Oil & Ref. Co.'s No. 1 Burnett, ur 2000 ft.

CHILDRESS COUNTY—Bell et al's Nos. 1 Harvey, sd 1040 ft; 1 Hayes, sd 50 ft. Burk et al's No. 1 Rowell, sd 1400 ft. Duluth Childress Oil Co.'s No. 1 Clutts, sd 3000 ft. Denver Gulf Oil Co.'s No. 1 Ryan, sd 740 ft. Essex Oil Co.'s No. 1 Smith, sd 1160 ft. L. L. D. Oil Co.'s No. 1 L. L. D. ranch, sd 200 ft. Modern Pet Co.'s No 1 Fields, sd 740 ft. Victor Oil Co.'s No. 1 Carter, sd 800 ft.

COLLINGSWORTH COUNTY—Buster Barnes Oil Co's No. 1 Shields, sd 1600 ft. Martha Alice Oil Synd.'s No. 1 Stokley, rigging up. United Southern Oil Co.'s Nos. 1 Hansard, dr 1750 ft; 1 McDowell, sd 440 ft.

DALLAM COUNTY—Dalhart Oil & Gas Co.'s No. 1 James, sd 1630 ft. Prairie Oil & Gas Co.'s No. 1 C. C. S., dr 225 ft. R. E. Taylor's No. 1 Merriweather, fsh 1160 ft.

DEAF SMITH COUNTY—Knox Oil & Gas Co.'s No. 1 Landergin, setting 10-inch casing 2500 ft.

DONLEY COUNTY—Atlanta Oil & Gas Co.'s No. 1 Grogan, sd 650 ft. Burk Creek Oil Co.'s No. 1 Moreman, sd 1600 ft. Crane New York Oil Co.'s No. 1 Bagbee, dr 2500 ft. Mutual Products Co.'s No. 1 Crisp, sd 700 ft.

HALL COUNTY—Coble Pet. Co.'s No. 1 Hollowfield, sd 3200 ft. Crayola Pet. Co.'s No. 1 Fuston, sd 600 ft. Estelline Red River Oil Co.'s No. 1 Wright, sd 1700 ft. Home People Oil Co.'s No. 1 Barnett, ur 1750 ft. Texas Virginia Oil Co.'s No. 1 Letts, sd 2100 ft.

HARTLEY COUNTY—Prairie Oil & Gas Co.'s Nos. 1 C. S. S., fighting cave, 2940 ft; 1 Lyman, dr 3200 ft.

HEMPHILL COUNTY—V. E. McInnis' No. 1 Hopkins, sd 1400 ft.

HUTCHINSON COUNTY—Coble Haywood Synd.'s No. 1 Coble, sd 730 ft. Oklahoma State Dev. Co.'s No. 1 Smith, sd 450 ft.

LIPSCOMB COUNTY—Hamilton Oil Co.'s No. 1 Gray, fsh 2900 ft.

MOORE COUNTY—Panhandle Ref. Co.'s No. L Thompson, dr 1950 ft. Shamrock Oil Co.'s No. 1 Sneed, sd 640 ft.

MOTLEY COUNTY—Matador Pet. Co.'s No. 1 Schols, sd 2100 ft. Motley County Oil Co.'s No. 1 Kingry, sd 250 ft.

OCHILTREE COUNTY—Casea Oil Co.'s No. 1 Coffee, sd 200 ft.

OLDHAM COUNTY—Benedum & Trees' Nos. 2 Matador, dr 1700 ft; 1 Healdton, dr 2230 ft. Gordon Trust Co.'s No. 1 Herring, sd 2500 ft. Humble Oil & Ref. Co.'s No. 1 Shelton, setting 10-inch casing, 200 ft. Issue Oil Co.'s No. 1 Matador, setting 8 inch 2830 ft.

PARMER COUNTY—Prairie Oil & Gas Co.'s No. 1 C. S. S., dr 2300 ft.

POTTER COUNTY—Amarillo Pet. Co.'s No. 2 Bivens, dr 3040 ft. Emerald Oil Co.'s No. 1 Masterson, fsh 2130 ft. Haines McSpadden's No. 1 Masterson sd 2550 ft. Miller Oil & Dev. Co.'s No. 1 Tanner, dr 2550 ft. Seven States Pet. Co.'s No. 1 Holbrook, dr 3275 ft. White Oil Corp.'s No. 1 Masterson, dr 3680 ft.

WHEELER COUNTY—Texas Northwestern Oil Co.'s No. 1 Martin, sd 400 ft.

Oklahoma Wildcats

Tulsa, Okla., Oct. 18.—The past week was one of unusual quietness in the Oklahoma Wildcat Counties with no test being completed. Several wells, however, had good showings for oil and will likely be drilled in sometime during the coming week. One of the most important showings found during the week was that of the MCK Oil Co.'s No. 1 Schoch, southwest 1-5-8w. Grady County. At 2476 feet the well has 1900 feet of oil standing in the hole but so far no gas pressure. This test is about 5½ miles due east of the Cement Pool in Caddo County. In Murray County the Stuyvesant Oil Co.'s No. 1 Ashton, southwest 7-1-3e, had a showing of oil at 1834-40 feet, drilling deeper it struck water at 1988 feet and is now drilling ahead at 2000 ft.

Other than a few new locations made the Cement Pool in southern Caddo County showed nothing new of importance for the week. Several wells are having considerable trouble in shutting off water.

(After the first report rigs and location will be eliminated until further operations are begun.)

BEACKHAM COUNTY—Green-Texas Oil Co.'s No. 1 Harris, southeast 34-7-24w, sd 1500 ft. Morten et al's No. 1 Cox, northeast 33-9-22w, sd 1250 ft. Pierce Oil Corp.'s No. 1, northeast 21-8-26w, dr 1300 ft. C. H. Taylor's No. 1, northeast 27-7-25w, fsh 2300 ft. Twin Hills Oil Co.'s No. 1 George, southwest 15-9-23w, sd 1560 ft.

BRYAN COUNTY—Bryan Drilling Co.'s No. 1 Potts, northwest 22-8s-8e, sd 650 ft. Durant Oil & Gas Co.'s No. 1 Webber, northeast 36-6s-10w, sd 480 ft. Riddle Oil Co.'s No. 1 McKay, 27-5s-10e, sd 770 ft.

BLAINE COUNTY—Ima Oil & Gas Co.'s No. 1 Everhart, northwest 7-18-10w, sd 2285 ft.

CADDO COUNTY—Anadarko Pet. Co.'s No. 1, southeast 26-6-10w, sd 2379 ft. Caddo Pet. Co.'s No. 1 Lindsay, southwest 36-6-10w, plugging back to test, total depth 2300 ft. Concrete Pet. Co.'s No. 1 Learns, southeast 2-5-9w, fsh 2280 ft. Cole Oil Co.'s No. 1

(Continued on page 241.)

PIPE LINE TO BLUE RIDGE

Houston, Texas, Oct. 20.—The Gulf Production Company is preparing to lay a six inch pipe line from Blue Ridge to Lynchburg, prelimary work on which has already started. Camps are now being built and the pipe line will be laid as soon as possible.

The Gulf Production Company has ordered two derricks for Blue Ridge, with evident plans for greater development. Other companies have had representatives on the grounds making locations.

DISTRIBUTING PLANT AT DALLAS

Houston, Texas, Oct. 20.—The Gulf Production Company will erect a concrete distributing plant at Dallas at a cost of approximately $100,000 and a permit for the erection of the first six units has been issued by D. C. McCord, building inspector of Dallas. The plant will be erected in the industrial district of Dallas, south of Commerce street at Hickory and the Texas & New Orleans Railway tracts. It will be the center for the distribution of all products of the company in Dallas. In addition to tanks and other equipment it will consist of a two-story concrete building, machine shop and garage. Work on the building will commence as soon as materials can be assembled and will be completed as soon as possible.

"STAG" HITTIN' ON ALL FOUR CYLINDERS THESE DAYS

W. H. Steigerwald, generally known throughout the Gulf Coast country as "Stag," is hittin' em on all twelve cylinders these days. Steigerwald opened his company for business only a few months ago, and as the Houston and South Texas agent for the B. F. Goodrich Company, he has succeeded in building up a large business in a record time. The offices of W. H. Steigerwald & Company are at 617 Washington avenue.

Mr. Steigerwald was formerly with the Southern Rubber & Belting Company of Houston. Having covered the Gulf Coast and Mexico territory for some time there are few fields in which he is not well known.

The company of which he is now the head handles a full line of the B. F. Goodrich Company's rubber goods, paying special attention to loading hose, belting, high pressure packing for air, steam and water, gaskets, water hose, drilling hose and valve seats.

HUMBLE OFFICIALS IN SESSION

Houston, Texas, Oct. 20.—Heads of departments and district managers for the Humble Oil & Refining Company met in Houston last week for a conference and inspection of the properties in this district. A luncheon was held at the Rice Hotel Saturday and on Sunday the visitors were taken to Bay Town for an inspection of the refinery and plant being erected there.

N. G. Guiberson of Houston came up to Dallas this week to be at the State Fair, where the Guiberson Corporation has arranged an attractive display for the oil fraternity.

Stephens County Daily Average Production Report for September

Gulf Prod. Co.

Well	Farm	Completed	Initial	Present	Sand	Remarks
1	Beyers	3-1920	5184	18	3312-3344	
1	Buchanan	7-1920	800	197	2435-2455	
1	Carlisle	8-1920	52	33	3105-3166	
1	Crowley, D. B.	8-1920	25	9	3323-3348	
A-1	Crowley, J. S.	3-1920	4200	..	3323-3350	
A-2	Crowley, J. S.	3-1920	185	..	3200-3280	
7			4385	56		
1	Davis, R. G.	9-1918	650	..	3238-3267	
2	Davis, R. G.	3-1919	200	..	3310-3326	
3	Davis, R. G.	6-1919	3600	..	3260-3283	
5	Davis, R. G.	11-1919	3535	..	3200-3295	
4			6985	360		
1	Dulaney	6-1919	300	126	3298-3303	
2	Fincher	9-1918	1590	..	3245-3290	
3	Fincher	4-1920	125	..	3125-3285	
4	Fincher	4-1919	2500	..	3160-5235	
6	Fincher	6-1919	150	..	3230-3243	
7	Fincher	10-1919	125	..	3290-3372	
8	Fincher	9-1919	1200	..	3165-3227	
9	Fincher	2-1920	48	..	3324-3369	
10	Fincher	2-1920	105	..	3240-3306	
11	Fincher	6-1920	15	..	3191-3314	
19			5766	240		
1	Harris, S. L.	12-1919	1600	..	3166-3245	
2	Harris, S. L.	12-1919	1600	..	3165-3245	
3	Harris, S. L.	4-1920	70	..	3200-3345	
4	Harris, S. L.	6-1920	10	..	3290-3375	
5	Harris, S. L.	8-1920	20	..	3242-3273	
5			1900	58		
1	Fambrough	2-1920	265	35	3247-3364	
1	Herrington	8-1919	145	..	3290-3338	
2	Herrington	8-1919	1600	..	3302-3305	
3	Herrington	10-1919	800	..	3303-3430	
4	Herrington	12-1919	350	..	3265-3296	
5	Herrington	4-1920	5	..	3289-3332	
5			2900	56		
1	Herrington, J. B.	3-1920	15	..	3252-3420	
2	Herrington, J. B.	5-1920	12	..	3240-3261	
2			27	13		
1	Hopper	9-1920	100	76	3298-3336	
1	Langford	10-1919	500	18	3290-3372	
2	McCauley	6-1919	3100	..	3181-3183	
4	McCauley	7-1920	25	..	3272-3416	
2			3125	40		
1	Moore, E. G.	4-1920	15	11	3264-3370	
1	Rollins, J. H.	12-1919	177	..	3291-3381	
2	Rollins, J. H.	4-1920	10	..	3291-3377	
3	Rollins, J. H.	9-1919	300	..	1825-1828	
4	Rollins, J. H.	5-1919	15	..	3270-3326	
5	Rollins, J. H.	8-1920	85	..	1777-1782	
5			587	241		
1	Sherman, E. L.	11-1919	50	..	3185-3260	
2	Sherman, E. L.	7-1920	10	..	3190-3346	*
2			60	61		
1	Sikes, C. E.	9-1920	25	23	3289-3408	
1	Smith, J. R.	3-1920	220	..	3059-3114	
3	Smith, J. R.	5-1920	160	..	3064-3111	
4	Smith, J. R.	7-1920	200	..	3064-3155	
3			580	565		
1	Spicer	6-1920	300	110	3209-3389	
1	Stanford	2-1920	16	15	3298-3363	
2	Stoker, I. A.	8-1920	500	..	3064-3100	
3	Stoker, I. A.	8-1920	1200	..	3064-3100	
4	Stoker, I. A.	8-1920	750	..	3068-3106	
5	Stoker, I. A.	8-1920	75	..	3082-3140	
6	Stoker, I. A.	8-1920	760	..	3005-3211	
7	Stoker, I. A.	9-1920	150	..	3100-3190	
6			3225	1464		
2	Stoker, K.	5-1920	12000	..	3281-3299	
3	Stoker, K.	7-1920	50	..	3210-3238	
4	Stoker, K.	9-1920	275	..	3178-3189	
3			12325	2430		
1	Sullivan	4-1920	15	15	3273-3463	*

Gulf Prod. Co. (Continued)

Well	Farm	Completed	Initial	Present	Sand	Remarks
B-1	Ward, J. M.	9-1920	175	..	3147-3207	
B-2	Ward, J. M.	8-1920	240	..	3016-3075	
B-3	Ward, J. M.	8-1920	400	..	3100-3167	
B-4	Ward, J. M.	8-1920	200	..	3091-3140	
B-6	Ward, J. M.	8-1920	300	..	3067-3081	
B-7	Ward, J. M.	9-1920	600	..	3066-3112	
6			19233	757		
C-1	Ward, J. M.	9-1920	800	..	3100-3180	
C-2	Ward, J. M.	3-1920	800	..	3104-3133	
C-3	Ward, J. M.	4-1920	325	..	3100-3125	
C-5	Ward, J. M.	9-1920	500	..	3150-3178	
C-6	Ward, J. M.	8-1920	35	..	3128-3166	*
5			2160	1283		
1	West, J., et al.	4-1920	180	83	3262-3312	
1	West, John	4-1920	940	60	3245-3312	
1	White, J. T.	2-1919	400	..	3304-3212	
2	White, J. T.	9-1919	300	..	3180-3245	
2			700	50		

Humble O. & R. Co.

1	Collins, A. J.	5-1920	250	192	3238-3392	
1	Collins, J. H.	1-1920	250	136	3211-3266	
2	Dickie	7-1920	800	612	3126-3151	
1	Guffie	4-1920	125	125	3027-3157	
1	Harris, J. L.	5-1920	175	..	2511-2535	*
3	Harris, J. L.	5-1920	25	..	3308-3444	*
5	Harris, J. L.	8-1920	60	..	3270-3310	
6	Harris, J. L.	4-1920	150	..	1788-1812	
8	Harris, J. L.	8-1920	30	..	1746-1761	
5			440	146		
1	Keel	3-1920	125	120	3133-3160	
2	Smith, J. W.	8-1920	90	40	1788-1793	
1	Yarbrough	8-1920	225	42	3207-3251	

Magnolia.

1	Akin, E. P.	4-1920	200	50	3124-3225	
1	Brown, C. B.	8-1918	800	..	3065-3099	
2	Brown, C. B.	7-1919	360	..	3032-3086	
3	Brown, C. B.	6-1920	2400	..	3043-3088	
4	Brown, C. B.	6-1920	2000	..	3061-3677	
5	Brown, C. B.	8-1920	260	..	3035-3094	
7	Brown, C. B.	9-1920	4000	..	3090-3035	
6			16220	3005		
1	Collins, W. H.	9-1919	55	..	3480-3532	
2	Collins, W. H.	8-1920	300	..	3401-3519	
2			355	110		
1	Dulaney	9-1919	150	16	3200-3294	
1	Frost	9-1919	500	..	3255-3282	
2	Frost	10-1919	100	..	3198-3260	
3	Frost	4-1919	1000	..	3234-3317	
4	Frost	3-1920	50	..	3198-3260	
5	Frost	8-1920	40	..	3190-3270	
5			1670	50		
1	Guest	3-1920	31	16	3208-3368	
1	Lanham, S. T.	6-1920	250	..	3205-3250	
3	Lanham, S. T.	5-1920	90	..	3220-3260	
2			340	70		
1	McCauley	8-1920	300	120	3119-3141	
1	Nemir	3-1920	40	20	3304-3340	
1	Pegue, M.	12-1919	200	..	3124-3152	
2	Pegue, M.	7-1920	100	..	3105-3206	
3	Pegue, M.	7-1920	10	..	3124-3267	
3			310	50		
1	Smith, J. R.	5-1920	200	..	3043-3089	
2	Smith, J. R.	2-1920	80	..	3089-3084	
2			280	50		
1	Sullivan, A. M.	12-1919	75	18	3250-3302	
1	Trammell	6-1920	30	..	1965-1975	
2	Trammell	4-1920	50	..	3250-3272	
2			80	60		
1	Ward, G. D.	9-1919	15	12	3028-3034	

* Pumping wells. All wells not marked (*) are flowing wells.

Stephens County Daily Average Production Report for September—Continued

Mid-Kansas.

Well	Farm	Completed	Initial	Present	Sand	Remarks
1	Douglas	7-1920	1200	372	3263-3275	
1	Graham	1-1920	Gas	72	3255-3292	
1	Hail	9-1920	90	18	3172-3256	
1	Harris, J. L.	6-1920	5	5	3168-3189	
1	Herrington	2-1920	800	..	3260-3416	
2	Herrington	4-1920	430	..	3266-3391	
3	Herrington	9-1920	10	..	3348-3350	
3			1240	105		
1	Hill, G. W.	7-1920	800	326	3262-3276	
1	Hill, J. W.	8-1919	400	235	3205-3235	
2	Hill, S. R.	7-1920	1250	..	3237-3255	
4	Hill, S. R.	9-1920	400	..	3237-3355	
2			1650	583		
1	Manning	4-1920	200	22	3183-3276	
1	McMeen	1-1920	25	..	3096-3180	
2	McMeen	12-1919	350	..	3102-3192	
3	McMeen	3-1920	30	..	2641-2675	
3			405	48		
1	Tulles	7-1919	200	..	3138-3237	
2	Tulles	8-1920	300	..	3187-3212	
2			500	601		

Monitor O. & G.

1	Sloan	3-1920	153	..	3140-3189	
2	Sloan	2-1920	240	..	3122-3174	
3	Sloan	5-1920	1650	..	3132-3136	
4	Sloan	8-1920	1660	..	3130-3138	
6	Sloan	8-1920	550	..	3125-3135	
5			4456	2125		
1	Walker	9-1919	70	..	3165-3210	
2	Walker	6-1920	700	..	3123-3147	
3	Walker	7-1920	100	..	3196-3220	
3			834	302		

Prairie.

1	Ackers	7-1920	3000	..	3046-3066	
2	Ackers	7-1920	400	..	3048-3082	
1	Akins, A. A.	12-1910	100	..	3212-3250	
2	Akins, A. A.	8-1920	300	..	3200-3228	
2			400	660		
1	Binney	10-1919	800	..	3208-3273	
3	Binney	1-1920	10	..	3189-3225	
2			300	51		
1	Jones	8-1920	550	..	3072-3137	
2	Jones	8-1920	250	..	3115-3143	
1	Lydon, R. F.	12-1919	250	131	3220-3229	
1	Gardenshire	12-1919	135	..	3260-3316	
2	Riddle	7-1920	105	61	1940-1950	
1	Serges	3-1920	282	..	3287-3393	
2	Serges	7-1920	50	..	3264-3304	
5	Serges	7-1920	400	..	3232-3300	
3			732	163		
1	Ware, J. M.	9-1920	1000	528	3560-3560	

Sinclair.

1	Coody	1-1919	100	..	3357-3360	
2	Coody	7-1919	500	..	3262-3360	
3	Coody	8-1919	280	..	3300-3396	
4	Coody	8-1919	500	..	3260-3382	
5	Coody	7-1919	415	..	3255-3341	
6	Coody	1-1920	100	..	3319-3400	
7	Coody	1-1920	50	..	3317-3400	
7			1335	105		
2	Fambrough	6-1920	75	41	3235-3386	*
1	Henderson	4-1920	260	45	3182-3192	
1	Hill, E. A.	6-1920	60	66	3459-3530	*
1	Manning	3-1920	300	..	3118-3195	
2	Manning	3-1918	4000	..	3148-3261	
3	Manning	6-1920	10	..	3163-3300	
3			4316	66		
1	Rogers	8-1920	200	128	3049-3063	
1	Smith	1-1920	50	56	3140-3192	
B-1	Stuard	6-1920	60	106	2047-2067	
1	Veale	12-1919	260	28	3587-3648	
1	Watson	2-1920	800	..	3105-3196	
2	Watson	5-1920	100	..	3189-3222	
3	Watson	6-1920	75	..	3180-3280	*
3			975	62		

* Pumping wells. All wells not marked (*) are flowing wells.

S. W. Oil & Dev. Co.

Well	Farm	Completed	Initial	Present	Sand	Remarks
2	Tolle	7-1920	1000	321	3130-3220	

Sun Co.

1	Chaney, J. E.	1-1920	500	..	3028-3188	
2	Chaney, J. E.	6-1920	150	..	3075-3118	
3	Chaney, J. E.	7-1920	450	..	3067-3118	
3			1100	448		
1	Glenn, J. E.	4-1920	150	56	1960-1960	
A-1	Jennings	9-1920	400	..	3400-3707	
A-2	Jennings	5-1920	105	..	3770-3470	
2			505	79		
2	Kell	8-1920	40	44	3148-5176	
1	Smith	12-1919	28	14	3240-3343	
1	Stoker, H.	6-1920	700	..	3150-3162	
2	Stoker, H.	6-1920	700	..	3166-3192	
3	Stoker, H.	5-1920	500	..	3150-3183	
4	Stoker, H.	6-1920	300	..	3146-3182	
5	Stoker	8-1920	150	..	3129-3169	
5			2350			
1	Todd	4-1920	150	126	3188-3227	
1	Ackers	6-1920	185	57	3062-3170	
1	Billingsley	2-1920	300	..	3170-3190	
2	Billingsley	10-1919	60	..	3175-3210	
3	Billingsley	4-1920	50	..	3102-3110	
4	Billingsley	3-1920	700	..	3134-3165	
4			1610	94		
1	Black Bros.	9-1919	210	..	3240-3390	
2	Black Bros.	4-1920	75	..	3236-3308	
5	Black Bros.	4-1920	60	..	3368-3480	
7	Black Bros.	8-1920	25	..	3218-3330	
4			370	160		
1	Bradshaw	2-1920	1464	..	3103-3172	
2	Bradshaw	4-1920	15	..	3280-3375	
3	Bradshaw	3-1920	100	..	3260-3321	
3			1579	198		

The Texas Co.

1	Brooks, M. J.	12-1919	125	..	3142-3172	
2	Brooks, M. J.	4-1919	250	..	3223-3283	
4	Brooks, M. J.	9-1919	1500	..	3180-3216	
6	Brooks, M. J.	8-1920	250	..	3141-3175	
7	Brooks, M. J.	8-1919	60	..	3156-3221	
5			2185	404		
1	Carey, W. L.	1-1920	80	18	3350-3452	
2	Chaney, J. M.	1-1920	225	..	3187-3258	
4	Chaney, J. M.	5-1920	250	..	3165-3210	
2			475	118		
1	Cook, J. M.	3-1920	50	59	3272-5350	
1	Curry, J. C.	12-1919	50	..	3871-3340	
2	Curry, J. C.	8-1919	600	..	3224-3280	
3	Curry, J. C.	8-1919	1400	..	3190-3216	
4	Curry, J. C.	11-1919	700	..	3160-3222	
4			2750	506		
1	Day, S. A.	1-1920	205	..	3036-3055	
3	Day, S. A.	6-1920	200	..	3020-3092	
5	Day, S. A.	6-1920	350	..	3028-3092	
3			750	666		
1	Ghelson	9-1919	110	..	3456-3480	
8	Ghelson	5-1920	1500	..	3150-3162	
2			1610	905		
1	Groseclose	4-1919	800	..	3067-3127	
2	Groseclose	11-1919	325	..	3154-3193	
4	Groseclose	6-1920	1000	..	3078-3134	
3			2125	564		
1	Houston, C. H.	10-1919	75	42	3305-3345	
1	Houston, W. F.	10-1919	100	..	3321-3424	
2	Houston, W. F.	9-1920	50	..	3362-3316	
2			150	114		
1	Houston, W. M.	5-1920	150	100	2845-2675	
1	Houston, S.	4-1920	1200	602	3245-3252	
1	Jackson	4-1920	225	..	3340-3989	
2	Jackson	2-1920	20	..	3340-3411	
2			245	30		

Stephens County Daily Average Production Report for September—Continued

The Texas Co.

Well	Farm	Completed	Initial	Present	Sand	Remarks
1	Keithley	4-1920	150	..	3245-3318	
3	Keithley	10-1919	50	..	3258-3278	
4	Keithley	12-1919	750	..	3255-3274	
3			950	30		
1	Lauderdale, B. F.	6-1919	250	30	3177-3277	
1	Lauderdale, S. W.	3-1919	350	..	3208-3234	
2	Lauderdale, S. W.	7-1919	150	..	3171-3240	
3	Lauderdale, S. W.	2-1920	300	..	3132-3192	
4	Lauderdale, S. W.	8-1919	500	..	3183-3221	
5	Lauderdale, S. W.	6-1920	130	..	3172-3239	
6	Lauderdale, S. W.	8-1920	35	..	3180-3240	
6			1465	286		
1	Martin, J. M.	5-1920	30	10	3215-3226	*
1	Neil, G. P.	4-1920	200	32	3260-3310	
1	Parks, J. M.	12-1918	50	..	3334-3370	
2	Parks, J. M.	3-1920	60	..	3271-3334	
3	Parks, J. M.	4-1920	20	..	3244-3307	*
4	Parks, J. M.	6-1920	15	..	3282-3311	*
4			145	22		
A- 1	Parks, J. W.	12-1918	246	..	3165-3100	
A- 2	Parks, J. W.	6-1918	281	..	3186-3332	
A- 3	Parks, J. W.	10-1919	204	..	3255-3273	
A- 4	Parks, J. W.	2-1920	90	..	3165-3246	
A- 5	Parks, J. W.	1-1920	200	..	3175-3238	
A- 6	Parks, J. W.	3-1920	50	..	3112-3182	
A-10	Parks, J. W.	7-1920	10	..	3120-3291	*
A-11	Parks, J. W.	2-1920	140	..	3168-3223	
A-13	Parks, J. W.	4-1920	10	..	3174-3257	
A-14	Parks, J. W.	10-1919	300	..	3225-3305	
A-15	Parks, J. W.	10-1919	100	..	1917-1954	
A-16	Parks, J. W.	1-1920	1200	..	3066-3088	
A-19	Parks, J. W.	2-1920	260	..	2440-2550	
12			3091	765		
B- 1	Parks, J. W.	8-1919	60	..	2292-2307	*
B- 2	Parks, J. W.	11-1919	178	..	3213-3269	
B- 3	Parks, J. W.	5-1919	250	..	3178-3240	
B- 4	Parks, J. W.	8-1920	70	..	3207-3311	
4			558	58		
1	Perce, J. S.	8-1919	400	..	3210-3228	
2	Pierce, J. S.	10-1919	222	..	3274-3298	
3	Pierce, J. S.	6-1920	440	..	3275-3345	
3			1062	202		
1	Sandidge, G. T.	9-1918	1000	..	3108-3228	
2	Sandidge, G. T.	5-1919	100	..	3259-3273	
3	Sandidge, G. T.	10-1919	1000	..	3350-3353	
4	Sandidge, G. T.	8-1919	30	..	3258-3260	
5	Sandidge, G. T.	4-1920	25	..	3250-3303	
6	Sandidge, G. T.	9-1919	25	..	3203-3230	
7	Sandidge, G. E.	10-1919	75	..	3130-3240	
8	Sandidge, G. T.	9-1919	100	..	2106-2240	
8			2355	114		
1	Smith, J. R.	3-1919	500	..	3045-3123	
4	Smith, J. R.	6-1920	780	..	3065-3108	
2			1280	183		
1	Stoker, K.	2-1919	2400	..	3163-3177	
2	Stoker, K.	7-1919	2400	..	3156-3184	
3	Stoker, K.	4-1920	75	..	3162-3192	
4	Stoker, K.	10-1919	750	..	3184-3224	
4			5625	86		
1	Stoker, Y. S.	9-1920	850	502	3030-3070	
1	Thomas, R. O.	3-1920	240	..	3255-3393	
1	Tomlinson	6-1920	750	..	3170-3176	
2	Tomlinson	7-1920	1000	..	3188-3273	
2			1750	500		
1	Womack, J. W.	10-1919	100	81	3124-3175	

T. & P. C. & O. Co.

Well	Farm	Completed	Initial	Present	Sand	Remarks
2	Adams, T. L.	5-1920	150	27	3683-3741	
11	Binney, C.	5-1919	40	..	1609-1628	*
12	Binney, C.	2-1920	25	..	1610-2728	*
14	Binney, C.	6-1919	10	..	1622-1628	*
15	Binney, C.	12-1919	150	..	3279-3314	*
17	Binney, C.	4-1920	25	..	3275-3314	
18	Binney, C.	4-1920	60	..	3277-3318	*
19	Binney, C.	5-1920	40	..	3280-3314	
20	Binney, C.	7-1920	25	..	3178-3250	*
21	Binney, C.	6-1920	20	..	3272-3408	*
25	Binney, C.	9-1920	75	..	1891-1926	
10			470	211		

* Pumping wells. All wells not marked (*) are flowing wells.

T. & P. C. & O. Co.—(Continued.)

Well	Farm	Completed	Initial	Present	Sand	Remarks
1	Bradford	2-1919	700	..	3592-3608	*
2	Bradford	2-1919	100	..	3547-3553	*
2			800	90		
1	Hohertz, A. B.	5-1919	40	..	1585-1607	*
2	Hohertz, A. B.	5-1919	40	..	1605-1637	*
3	Hohertz, A. B.	5-1919	40	..	1593-1638	*
4	Hohertz, A. B.	6-1920	200	..	1637-1666	
5	Hohertz, A. B.	5-1919	40	..	1592-1612	*
6	Hohertz, A. B.	12-1919	60	..	1614-1643	*
7	Hohertz, A. B.	12-1919	50	..	1597-1617	*
8	Hohertz, A. B.	12-1919	50	..	1604-1624	*
9	Hohertz, A. B.	7-1920	50	..	1600-1628	*
9			570	306		
1	Roberts, A. D.	3-1920	50	..	1721-1734	
2	Roberts, A. D.	4-1920	100	..	1663-1682	
3	Roberts, A. D.	3-1920	300	..	1710-1715	
4	Roberts, A. D.	4-1920	300	..	1711-1716	
5	Roberts, A. D.	5-1920	250	..	1736-1757	
6	Roberts, A. D.	4-1920	400	..	1650-1655	
7	Roberts, A. D.	5-1920	300	..	1750-1778	
8	Roberts, A. D.	6-1920	30	..	1647-1680	*
10	Roberts, A. D.	8-1920	200	..	1712-1726	
11	Roberts, A. D.	6-1920	20	..	1704-1720	*
10			1950	651		
2	Jackson, J. R.	7-1920	25	..	3182-3230	*
1	Newnham	5-1920	100	18	3319-3322	
2	Smith, A. M.	4-1920	60	62	1956-1966	
1	Stuart	5-1920	480	61	3563-3668	
1	Walker, N.	2-1920	100	94	3252-3331	*

Ajax Oil Co.

1	Tolle	5-1920	1500	..	3103-3237	
2	Tolle	5-1920	1000	..	3109-3199	
2			2500	364		

American O. & E. Co.

1	Stanford	1-1919	50	..	3355-3207	
2	Stanford	11-1919	5400	..	3288-3376	
3	Stanford	3-1920	36	..	3200-3376	
4	Stanford	5-1920	500	..	.....	
4			5800	103		

Ardizzone Braden.

1	Rogers	6-1920	150	41	3199-3297	

Atlantic O. P. Co.

1	Dunlap	4-1920	40	25	3122-3197	
1	West, M. E.	4-1920	160	255	3063-3104	

Best, Hogan..

1	School Block	9-1920	700	98	3116-3158	

Bradley Co.

1	Guffie	9-1920	750	88	3039-3115	
1	Rosenquest	8-1920	500	120	3054-3098	

Breckenridge Oil Corp.

1	Buchanan	11-1919	100	100	3286-3290	

Breckenridge Oil & G. Co.

1	Wragg, L.	5-1920	600	..	3112-3186	
2	Wragg, L.	6-1920	800	..	3100-3147	
2			1400	455		

Brown & Co.

1	Heathley	11-1919	1100	..	3162-3223	
2	Heathley	2-1920	500	..	3166-3190	
3	Heathley	3-1920	700	..	3193-3202	
5	Heathley	5-1920	900	..	3138-3158	
6	Heathley	9-1920	150	..	3150-3174	
5			3350	609		
1	Guest	6-1920	900	258	3144-3189	
1	Guffie	2-1920	60	23	3220-3240	
1	Sloan	6-1920	600	350	3088-3188	

Carteret Oil Co.

1	Walker, N.	5-1920	100	56	3288-3316	

Central Dev. Co.

1	Brown	6-1920	400	266	3116-3169	

O. H. Chapman.

1	Adams	11-1919	340	..	3598-3604	
2	Adams	4-1920	50	..	3580-3678	
3	Adams	1-1920	400	..	3530-3596	
3			790	36		

Stephens County Daily Average Production Report for September—Continued

H. C. Chapman.

Well	Farm	Completed	Initial	Present	Sand	Remarks
1	Ackers	5-1920	450	209	3091-3125	
1	Chaney	3-1920	700	..	3077-3112	
2	Chaney	6-1920	800	..	3062-3085	
2			1500	477		
1	Curry, R.	8-1920	800	..	3040-3089	
2	Curry, R.	8-1920	500	..	3114-3154	
2			1300	300		
1	Glenn	6-1920	300	15	3200-3248	
1	Hale	12-1919	475	..	3030-3180	
2	Hale	4-1919	400	..	3080-3130	
2			875	500		
1	Johnson	6-1920	100	..	3243-3260	
2	Johnson	9-1920	750	..	3220-3334	
3	Johnson	9-1920	900	..	3209-3259	
3			1750	440		
1	Owens	6-1920	400	59	3227-3283	
1	Peaks	4-1920	1000	..	3140-3188	
2	Peaks	9-1920	500	..	3081-3181	
2			1500	300		
1	Veale	3-1920	200	..	3070-3138	
2	Veale	7-1920	15	..	3062-3085	
3	Veale	8-1920	10	..	3040-3112	
3			225	225		
1	Walker	7-1920	860	..	3142-3180	
2	Walker	8-1920	2000	..	3072-3097	
3	Walker	9-1920	3000	..	3130-3152	
3			5860	2581		

Gaddis Trustee.

1	Jones	8-1920	400	303	3065-3110	

Cliff, W. E.

1	Yandell	8-1920	20	15	3168-1390	

Consedine & Martin.

1	Martin, C. S.	6-1920	600	303	3243-3291	

Consedine & Hale.

1	Martin, M. F.	5-1920	150	54	3187-3226	

Coogan Oil Co.

1	Burke	5-1920	400	14	3270-3360	

Cooper Henderson.

1	Chaney	2-1920	590	465	3093-3150	
1	Martin, M.	6-1920	500	..	3185-3228	
2	Martin, M.	7-1920	600	..	3159-3183	
3	Martin, M.	8-1920	1200	..	3137-3171	
4	Martin, M.	7-1920	600	..	3127-3157	
5	Martin, M.	7-1920	800	..	3160-3184	
5			3700	1344		
1	Rosenquest	9-1920	550	231	3115-3143	
1	Yandell	5-1920	350	104	3165-3205	

Crowell & Gant.

1	Herrington	1-1920	800	34	3245-3351	
2	Smith, J. R.	6-1920	500	..	3070-3133	

Gross Bros.

1	Brown	9-1920	600	87	3140-3186	

Del Tex Oil Co.

1	Smith, J. R.	3-1920	200	..	3133-3168	
2			700	204		

Empire Gas & Fuel Co.

1	Stevenson	11-1919	400	..	3134-3206	
3	Stevenson	9-1919	360	..	3131-3180	
2			760	591		

Fidelity Trust.

1	Walker, N.	6-1920	345	240	2050-2074	

Fensland O. & Gas Co.

1	Walker	3-1920	200	..	3105-3180	
2	Walker	7-1920	770	..	3150-3197	
2			970	646		
1-A	Walker Caldwell	9-1920	1400	245	3108-3165	

Galvez Oil Co.

1	Dickey	4-1920	3960	..	3103-3127	
2	Dickey	9-1920	200	..	3107-3228	
2			4260	447		
1	Ward, C. E.	5-1920	400	224	3122-3155	

Greenwood-Terrell.

2	Daggett	6-1920	300	410	3232-3350	

Gonzales Creek Oil Co.

1	Pierce	8-1920	5000	3072	3030-3065	

Hale Knight.

1	Walker Caldwell	9-1920	400	305	3098-3147	

Hemon et al.

1	Guffee	8-1920	350	..	3033-3103	
2	Guffee	9-1920	300	..	3047-3112	
2			650	210		

Hamon Sankey.

1	Guffee	8-1920	450	340	3028-3100	

Harris Stephens.

1	Turner	7-1920	50	135	1722-1727	*

Hercules.

1	Bradshaw	6-1920	150	30	3195-3296	

Hogan et al.

1	Campbell	7-1920	250	208	3105-3151	

Ibex Oil Co.

1	Carter	6-1920	2500	..	3113-3153	
2	Carter	9-1920	1400	..	3035-3065	
2			3900	585		

Independent Producers.

1	Walker	7-1920	600	375	3122-3156	
1	School Lot	6-1920	150	25	3212-3282	
1	Sullivan	4-1920	1000	88	3212-3360	

J. White Oil Co.

1	Lindley	6-1920	700	221	3135-3167	
1	Holland	4-1920	150	44	3304-3438	
1	Hale	8-1920	850	..	3060-3092	
2	Hale	9-1920	300	..	3071-3121	
2			1150	1500		

Law Tex Oil Co.

1	Burke	1-1920	1800	42	3221-3357	

Louis Oil & Gas Co.

2	Sloan	8-1920	750	446	3161-3196	

Link Oil Company.

1	Johnson	8-1920	500	264	3146-3162	

Livingston Oil Co.

1	Ackers	9-1920	600	167	3111-3137	

Lone Star Oil & Gas Co.

1	Heathley	7-1919	110	..	3164-3259	
2	Heathley	7-1919	2265	..	3164-3204	
3	Heathley	7-1919	300	..	3148-3196	
4	Heathley	6-1920	300	..	3143-3383	
4			2975	450		
1	Warren	11-1918	40	..	1690-1696	*
2	Warren	1-1920	1000	..	3183-3312	
3	Warren	9-1919	40	..	1608-1629	*
4	Warren	9-1919	75	..	1608-1613	*
6	Warren	11-1919	35	..	1601-1613	*
7	Warren	2-1920	125	..	1580-1620	*
8	Warren	3-1920	50	..	1625-1651	*
7			1365	350		

* Pumping wells. All wells not marked (*) are flowing wells.

Stephens County Daily Average Production Report for September—Continued

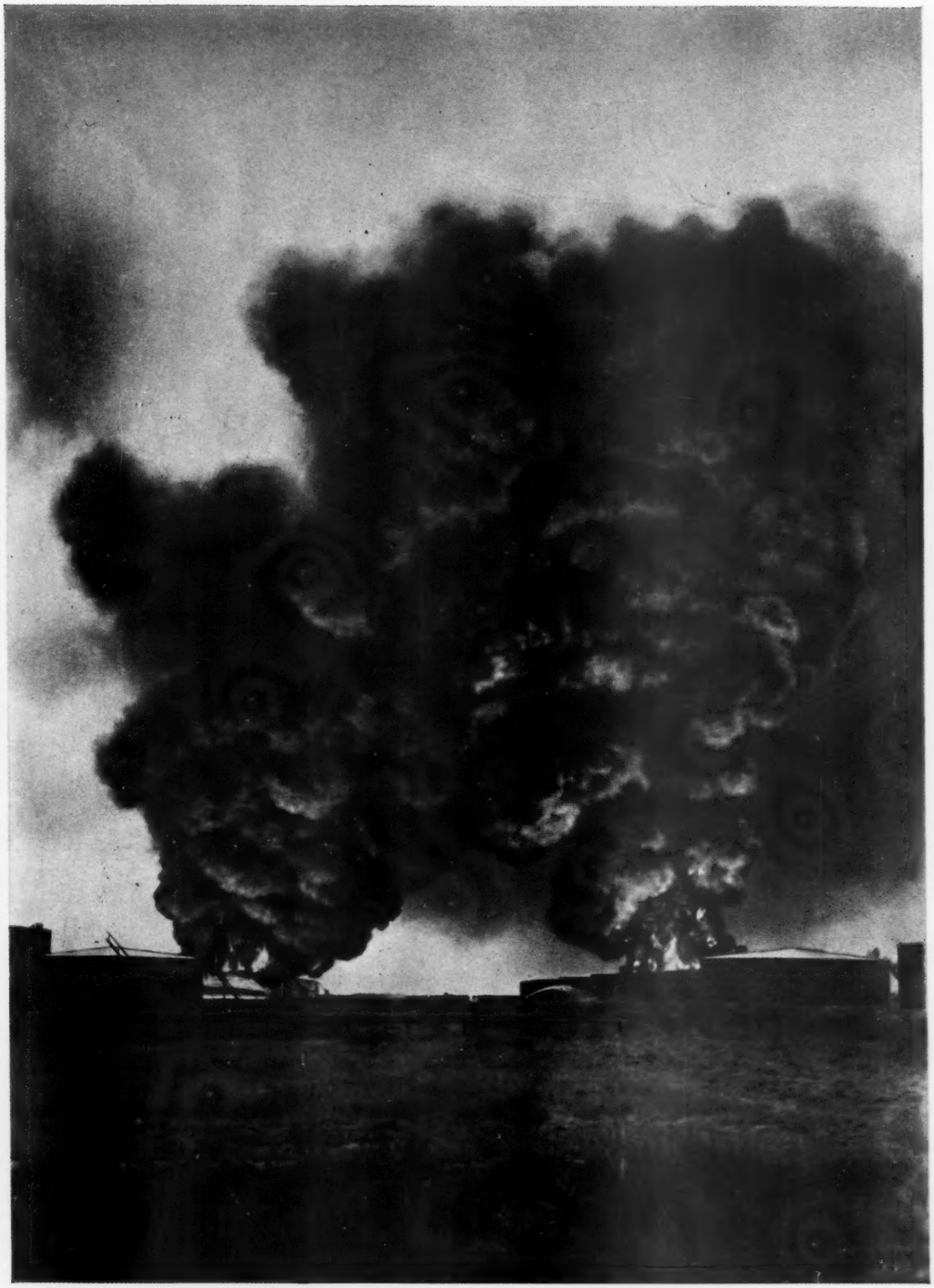
Louisiana Stephens.

Well	Farm	Completed	Initial	Present	Sand	Remarks
1	Parks	7-1920	300	150	3118-3154	
Mauhlstedt Mock.						
1	Sylvanus	7-1920	350	61	3176-3193	
1	Peak	6-1920	450	150	3144-3181	
1	Ackers	6-1920	750	188	3105-3142	
Mineral Wells.						
1	Wallace	11-1919	180	..	1790-1862	
3	Wallace	3-1920	230	..	1739-1773	
2			410	19		
Mock et al.						
1	Frost	9-1920	450	140	3126-3178	
Montreal Oil Co.						
1	Harris	2-1920	5000	400	3257-3262	
1	Henderson	9-1920	120	52	3195-3246	
Moorman Gholson.						
1	Hand	4-1920	350	65	3177-3304	
Naticnal Oil Synd.						
1	Smith et al.	9-1920	475	214	3123-3166	
Ohio Ranger.						
1	Gratz	4-1920	300	37	3298-3325	
Ohio Texas Oil Co.						
1	Crowley	5-1920	150	18	3042-3182	
Ouichita Ranger.						
1	Walker, N.	8-1920	860	302	2800-2860	
Phillips Pet. Co.						
1	Darnell	7-1920	250	156	3256-3280	
1	Madden	12-1919	50	..	2660-2690	
2	Madden	1-1920	50	..	2650-2685	
2			100	20		
1	Long, S. A.	9-1919	1000	..	3341-3407	
2	Long, S. A.	5-1920	50	..	2207-2228	
3	Long, S. A.	2-1920	25	..	3335-3308	
4	Long, S. A.	1-1920	400	..	3452-3530	
5	Long, S. A.	28-1920	375	..	3346-3453	
6	Long, S. A.	2-1920	50	..	3357-3472	
7	Long, S. A.	1-1920	10	..	3347-3452	
9	Long, S. A.	2-1920	75	..	3370-3450	
8			1985	73		
Pierce Oil Co.						
4	Durke	6-1920	100	83	3383-3417	
1	Glenn, M. V.	6-1920	600	338	3224-3268	
1	Yandell	12-1919	300	64	3155-3159	
Planters Oil & Gas Co.						
1	Walker, N.	8-1920	200	138	3235-3340	
Plateau Oil Co.						
1	Ward, E. C.	5-1920	4200	..	3068-3082	
2	Ward, E. C.	9-1920	1200	..	3061-3141	
2			4300	4498		
Pocahontas Oil Co.						
1	Ackers, W. H.	8-1920	35	30	3156-3188	
Ranger Brooks.						
1	Bradshaw	8-1920	300	93	3178-3258	
Ranger-Gulf.						
1	Branch, C.	11-1919	1200	..	3176-3234	
2	Branch, C.	4-1920	400	..	3165-3336	
3			2200	520		
1	Curry, A. J.	9-1920	156	291	3063-3180	
Republic.						
1	Brown	7-1920	400	240	3176-3212	
Rex Oil Co.						
1	Brown	7-1920	200	335	3143-3190	
Riley et al.						
1	Johnson	6-1920	1400	..	3247-3364	
2	Johnson	9-1920	650	..	3260-3290	
2			2050	742		
1	Walker	5-1920	600	..	3144-3164	
2	Walker	8-1920	500	..	3115-3137	
2			1100	174		
Sapulpa Ref. Company.						
1	Ball, J. F.	6-1920	1500	286	3331-3350	
Scott Oil & Ref. Co.						
1	O'Neil	8-1920	350	418	3139-3173	
1	Vance Max	5-1920	200	285	3135-3157	

* Pumping wells. All wells not marked (*) are flowing wells.

Security Oil Co.

Well	Farm	Completed	Initial	Present	Sand	Remarks
1	Sayles	7-1920	600	499	3100-3130	
Shamrock Oil Co.						
1	Veal	3-1920	500	..	3047-3079	
2	Veal	7-1920	350	..	3060-3090	
2			850	450		
Shawmut Pet. Co.						
1	Phillips	9-1920	200	85	3270-3296	
Snowden & McSweeney.						
1	Ackers	9-1919	100	..	3117-3175	
2	Ackers	9-1920	1200	..	3075-3110	
2			1300	284		
1	Ackers	8-1920	600	..	3001-3123	
2	Ackers	6-1920	368	..	3001-3116	
3	Ackers	6-1920	850	..	3112-3148	
4	Ackers	6-1920	75	..	3110-3143	
4			1910	762		
1	Higginbotham	8-1920	800	..	3115-3130	
2	Higginbotham	5-1920	750	..	3104-3120	
3	Higginbotham	7-1920	6000	..	3105-3123	
4	Higginbotham	7-1920	3000	..	3115-3142	
5	Higginbotham	8-1920	900	..	3104-3132	
5			11450	2986		
1	Sylvanus	9-1920	400	..	3178-3216	
2	Sylvanus	7-1920	750	..	3150-3190	
2			1150	340		
Stanley et al.						
1	Ackers	7-1920	600	..	3150-3177	
2	Ackers	9-1920	1000	..	3158-3190	
2			1600	340		
Stephens County Oil Co.						
1	Castleman	6-1920	450	150	3053-3121	
1	Paschal, M.	8-1920	800	..	3030-3110	
Strong Oil Corp.						
1	Miller	9-1920	600	150	3126-3170	
Swensondale Oil Co.						
1	Swenson	6-1919	8000	..	3130-3181	
2	Swenson	9-1919	750	..	3134-3182	
4	Swenson	11-1919	400	..	1769-1810	
5	Swenson	5-1919	50	..	2816-2880	
7	Swenson	5-1920	40	..	3212-3316	
13	Swenson	2-1920	5000	..	3254-3278	
15	Swenson	6-1920	70	..	1728-1788	
7			12810	547		
Texas Knight.						
1	Curry, C.	3-1920	500	201	3138-3168	
Texhoma Oil & Ref. Co.						
1	Ledbetter	10-1919	600	46	3273-3335	
Thraves Oil Co.						
1	Mill	11-1919	475	..	3536-3576	*
2	Mill	4-1920	150	..	3476-3540	
2			625	98		
Turner et al.						
1	Lamb	9-1920	600	424	3110-3164	
Virginia Oil Company.						
1	Peeks	6-1920	1100	540	3152-3172	
1	Walker Caldwell	6-1920	1400	532	3125-3157	
Vulcan Oil Company.						
1	Fletcher	12-1919	1500	51	3237-3314	
1	Milholland	2-1920	750	..	3225-3300	
2	Milholland	1-1920	20	..	3270-3340	
8			770	37		
1	Walker, N.	1-1920	500	195	3220-3374	
1	Williams	1-1920	800	41	2060-2130	
Walker Caldwell.						
2	Jones	12-1919	20	12	3116-3308	
1	McAllister	5-1920	400	44	3203-3360	
Walker Perkins.						
1	Goodwin, W. O.	6-1920	5000	1630	3145-3170	
Western Exploration Co.						
1	Ledbetter	9-1919	900	..	3257-3304	*
2	Ledbetter	5-1920	10	..	3276-3360	*
2			910	24		
White Seal Petroleum Co.						
1	Lauderdale	8-1920	500	245	3140-3204	



TANK FARM FIRE IN OKLAHOMA

Courtesy Ludlow Valve Company
Kansas City

World's Production of Crude Petroleum Since 1857, by Years and Countries, in Barrels of 42 Gallons

Year	Rumania	United States*	Italy	Canada	Russia	Galicia	Japan and Formosa	Germany	India	Dutch East Indies	Peru	Mexico	Argentina	Trinidad	Egypt	Other Countries	Total	Year	Pct. Prod. by U. S.
1857	1,977	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,977	1857	.00
1858	3,560	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,560	1858	.00
1859	4,349	2,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,349	1859	31.5
1860	8,542	500,000	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	508,578	1860	98.3
1861	17,279	2,113,609	29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,130,917	1861	99.1
1862	23,198	3,056,690	29	11,775	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,091,692	1862	98.8
1863	27,943	2,611,309	58	82,814	40,816	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,762,940	1863	94.5
1864	33,013	2,116,109	72	90,000	64,686	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,303,780	1864	90.5
1865	39,017	2,497,700	2,265	110,000	66,542	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,715,524	1865	91.9
1866	42,534	3,597,700	992	175,000	83,052	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,899,278	1866	92.3
1867	50,838	3,347,300	791	190,000	119,917	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,708,846	1867	90.2
1868	55,369	3,646,117	367	200,000	88,327	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,990,180	1868	91.2
1869	58,533	4,215,000	144	220,000	202,308	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,695,985	1869	89.9
1870	83,765	5,260,745	86	250,000	204,618	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,799,214	1870	90.7
1871	90,030	5,205,234	273	269,397	165,129	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,730,063	1871	90.8
1872	91,251	6,293,194	331	308,100	184,391	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,877,267	1872	91.5
1873	104,036	9,893,786	467	365,052	474,379	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,837,720	1873	91.3
1874	103,177	10,926,945	604	168,807	583,751	149,837	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,933,121	1874	91.5
1875	108,569	8,787,514	813	220,000	697,364	158,522	4,566	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,977,348	1875	88.1
1876	111,314	9,132,669	2,891	312,000	1,320,528	164,157	7,708	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,051,267	1876	82.6
1877	108,569	13,350,363	2,934	312,000	1,800,720	169,792	9,560	.....	.....	.....	.....	.....	.....	.....	.....	.....	15,753,938	1877	85.4
1878	109,300	15,396,868	4,329	312,000	2,400,960	175,420	17,884	.....	.....	.....	.....	.....	.....	.....	.....	.....	18,416,761	1878	84.7
1879	110,007	19,914,146	2,891	575,000	2,761,104	214,800	23,457	.....	.....	.....	.....	.....	.....	.....	.....	.....	23,601,405	1879	84.3
1880	114,321	26,286,123	2,035	350,000	3,091,200	229,120	25,497	9,310	.....	.....	.....	.....	.....	.....	.....	.....	30,017,606	1880	87.6
1881	121,511	27,661,238	1,237	275,000	3,601,441	286,400	16,751	29,219	.....	.....	.....	.....	.....	.....	.....	.....	31,992,797	1881	86.4
1882	136,610	30,349,897	1,316	275,000	4,537,815	330,076	15,549	58,025	.....	.....	.....	.....	.....	.....	.....	.....	35,704,288	1882	85.0
1883	139,486	23,449 633	1,618	250,000	6,002,401	365,160	20,473	26,708	.....	.....	.....	.....	.....	.....	.....	.....	30,255,479	1883	77.5
1884	210,667	24,218,438	2,855	250,000	10,804,577	408,120	27,923	46,161	.....	.....	.....	.....	.....	.....	.....	.....	35,968,741	1884	67.3
1885	193,411	21,858,785	1,941	250,000	13,924,596	465,400	29,237	41,360	.....	.....	.....	.....	.....	.....	.....	.....	36,764,730	1885	59.4
1886	168,606	28,064,841	1,575	584,061	18,006,407	305,884	37,916	73,864	.....	.....	.....	.....	.....	.....	.....	.....	47,243,154	1886	59.4
1887	181,907	28,283,483	1,496	525,655	18,367,781	343,832	28,645	74,284	.....	.....	.....	.....	.....	.....	.....	.....	47,807,083	1887	59.2
1888	218,576	27,612,025	1,251	695,203	23,048,787	466,537	37,436	84,782	.....	.....	.....	.....	.....	.....	.....	.....	52,164.597	1888	52.9
1889	297,666	35,163,513	1,273	704,690	24,609,407	515,268	52,811	68,217	94,250	.....	.....	.....	.....	.....	.....	.....	61,507,095	1889	57.2
1890	383,227	45,823,572	2,998	795,030	28,691,218	659,012	51,420	108,296	118,065	.....	.....	.....	.....	.....	.....	.....	76,632,838	1890	59.9
1891	488,201	54,292,655	8,305	755,298	34,573,181	630,730	52,917	108,929	190,131	.....	.....	.....	.....	.....	.....	.....	91,100,347	1891	59.6
1892	593,175	50,514,657	18,321	779,753	35,774,504	646,220	68,901	101,404	242,284	.....	.....	.....	.....	.....	.....	.....	88,739,219	1892	56.9
1893	535,655	48,431,066	19,069	798,406	40,456,519	692,669	106,384	99,390	298,969	600,000	.....	.....	.....	.....	.....	.....	92,038,127	1893	52.6
1894	507,255	49,344,516	20,552	829,104	36,375,428	949,146	171,744	122,564	327,218	688,170	.....	.....	.....	.....	.....	.....	89,335,697	1894	55.2
1895	575,200	52,892,276	25,843	726,138	46,140,174	1,452,999	141,310	121,277	371,536	1,215,757	.....	.....	.....	.....	.....	.....	103,662,510	1895	51.0
1896	543,348	60,960,361	18,149	726,822	47,220,633	2,443,080	197,082	145,061	429,979	1,427,132	47,536	.....	.....	.....	.....	.....	114,159,183	1896	53.4
1897	570,886	60,475,516	13,892	709,857	54,399,568	2,226,368	218,559	165,745	545,704	2,551,649	70,831	.....	.....	.....	.....	.....	121,948,575	1897	49.5
1898	776,238	55,364,233	14,489	758,391	61,609,357	2,376,108	265,389	183,427	542,110	2,964,035	70,905	.....	.....	.....	.....	.....	124,924,682	1898	44.4
1899	1,425,777	57,070,850	16,121	808,570	65,954,968	2,313,047	536,079	192,232	940,971	1,795,961	89,166	.....	.....	.....	.....	.....	131,143,742	1899	43.5
1900	1,628,535	63,620,529	12,102	913,498	75,779,417	2,346,505	866,814	358,297	1,078,264	2,253,355	274,800	.....	.....	.....	.....	.....	149,132,116	1900	42.5
1901	1,678,320	69,389,194	16,150	756,679	85,168,556	3,251,544	1,110,790	313,630	1,430,716	4,013,710	274,800	10,345	.....	.....	.....	†20,000	167,434,434	1901	41.4
1902	2,059,935	88,766,916	18,933	530,624	80,540,044	4,142,159	1,193,038	353,674	1,617,363	2,430,465	286,725	40,200	.....	.....	.....	†26,000	182,006,076	1902	48.8
1903	2,763,117	100,461,337	17,876	486,637	75,591,256	5,234,475	1,209,371	445,818	2,510,259	5,770,056	278,092	75,375	.....	.....	.....	†36,000	194,879,669	1903	51.5
1904	3,599,026	117,080,960	25,476	552,575	78,536,655	5,947,383	1,419,473	637,431	3,385,468	6,508,485	345,834	125,625	.....	.....	.....	†40,000	218,204,391	1904	53.7
1905	4,420,987	134,717,580	44,027	634,095	54,960,270	5,765,317	1,472,804	560,963	4,137,098	7,849,896	447,880	251,250	.....	.....	.....	†30,000	215,292,167	1905	62.6
1906	6,378,184	126,493,936	53,577	569,753	58,897,311	5,467,967	1,710,768	578,610	4,015,803	8,180,657	536,294	502,500	.....	.....	.....	†30,000	213,415,360	1906	59.2
1907	8,118,207	166,095,335	59,875	788,872	61,850,734	8,455,841	2,001,838	756,631	4,344,162	9,982,597	756,226	1,005,000	101	.....	.....	†30,000	264 245,419	1907	63.2
1908	8,252,157	178,527,355	50,966	527,987	62,186,447	12,612,295	2,070,145	1,009,278	5,047,038	10,283,357	1,011,180	3,932,900	11,472	169	.....	†30,000	285,552,746	1908	62.5
1909	9,327,278	183,170,874	42,388	420,755	65,970,350	14,932,799	1,889,563	1,018,837	6,676,517	11,041,852	1,316,118	2,713,500	18,431	57,143	.....	†20,000	298,616,405	1909	61.3
1910	9,723,806	209,557,248	50,830	315,895	70,336,574	12,673,688	1,930,661	1,032,522	6,137,990	11,030,620	1,330,105	3,634,080	20,753	142,857	.....	†20,000	327,937,629	1910	64.0
1911	11,107,450	220,449,391	74,709	291,096	66,183,691	10,519,270	1,658,903	1,017,045	6,451,203	12,172,949	1,368,274	12,552,798	13,119	285,307	9,150	†20,000	344,174,355	1911	64.0
1912	12,976,232	222,935,044	53,778	243,336	68,019,208	8,535,174	1,671,405	1,031,050	7,116,672	10,845,624	1,751,143	16,558,215	47,007	436,805	205,905	†20,000	352,446,598	1912	68.9
1913	13,554,768	248,446,230	47,198	228,080	62,834,356	7,818,130	1,942,009	†995,764	7,930,149	11,172,294	2,133,261	25,696,291	130,618	503,616	94,635	†20,000	383,547,399	1913	64.7
1914	12,826,579	265,762,535	39,849	214,805	67,020,522	†5,033,350	2,738,378	†995,764	7,409,792	‡11,834,802	1,917,802	26,235,403	275,500	643,533	777,038	†20,000	403,745,342	1914	65.8
1915	12,029,913	281,104,104	43,898	215,464	68,548,062	4,158,899	3,118,464	†995,764	8,202,674	‡12,386,800	2,487,251	32,910,508	516,120	†750,000	262,208	†10,000	427,740,129	1915	65.7
1916	¶10,298,208	300,767,158	50,585	198,123	¶72,801,110	6,461,706	2,997,178	†995,764	8,491,137	‡13,174,399	2,550,645	40,545,712	796,920	928,581	411,000	†25,000	461,493,226	1916	65.2
1917	†2,681,870	335,315,601	†50,334	205,332	†69,000,000	¶5,965,447	2,898,654	†995,764	8,078,843	‡12,928,955	2,533,417	55,292,770	1,144,737	1,599,455	1,008,750	§7,004,973	506,702,902	1917	66.2
1918	8,730,235	355,927,716	35,953	304,741	40,456,182	5,591,620	2.449,069	711,260	8,000,000	13,284,936	2,536,102	63,828,327	1,321,315	2,082,068	2,079,750	§7,390,080	514,729,354	1918	69.1
1919	.....	377,719,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	87,359,533	.....	.....	.....	.....	.....		....
Total.	151,722,700	4,986,290,719	983,242	24,417,270	1,873,039,199	154,051,273	38,514,523	16,664,121	106,162,365	188,388,203	24,414,387	373,270,332	4,296,093	7,429,534	4,848,436	21,990,053	7,976,482,450		

*Quantity marketed. †Estimated. ‡Includes British Borneo. ¶Estimated in part. §Includes Cuba, 19,167 barrels; Venezuela, 127,743 barrels; Persia 6,856,063.
Figures from United States Geological Survey, Department of Interior. No 1919 production figures available except for United States and Mexico.

Petroleum Marketed in the United States, 1859-1919, in Barrels of 42 Gallons

Year	Pennsylvania and New York	Ohio	West Virginia	California	Kentucky and Tennessee	Colorado	Indiana	Illinois	Kansas	Texas	Missouri	Oklahoma	Wyoming	Louisiana	United States	Total Value	Year
1859	2,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,000	$ 32,000	1859
1860	500,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	500,000	4,800,000	1859
1861	2,113,609	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,113,609	1,035,668	1861
1862	3,056,690	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,056,690	3,209,525	1862
1863	2,611,309	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,611,309	8,225,663	1863
1864	2,116,109	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,116,109	20,896,576	1864
1865	2,497,700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,497,700	16,459,853	1865
1866	3,597,700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,597,700	30,455,398	1866
1867	3,347,300	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,347,300	8,066,993	1867
1868	3,646,117	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3 646,117	13,217,174	1868
1869	4,215,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,215,000	23,730,450	1869
1870	5,260,745	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,260,745	20,503,754	1870
1871	5,205,234	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,205,234	22,591,180	1871
1872	6,293,194	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,293,194	21,440,503	1872
1873	9,893,786	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,983,786	18,100,464	1873
1874	10,926,945	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,926,945	12,647,527	1874
1875	8,787,514	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,787,514	7,368,133	1875
1876	8,968,906	31,763	120,000	12,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9,132,669	22,982,822	1876
1877	13,135,475	29,888	172,000	13,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,350,363	31,788,566	1877
1878	15,163,462	38,179	180,000	15,227	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15,396,868	18,044,620	1878
1879	19,685,176	29,112	180,000	19,858	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19,914,146	17,210,708	1870
1880	26,027,631	38,940	179,000	40,552	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	26,286,123	24,600,638	1880
1881	27,376,509	33,867	151,000	99,862	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,661,238	25,448,339	1881
1882	30,053,500	39,761	128,000	128,636	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30,349,897	23,631,165	1882
1883	23,128,389	47,632	126,000	142,857	4,755	.....	.....	.....	.....	.....	.....	.....	.....	.....	23,449,663	25,790,252	1883
1884	23,772,209	90,081	90,000	262,000	4,148	.....	.....	.....	.....	.....	.....	.....	.....	.....	24,218,438	20,595,966	1884
1885	20,776,041	661,580	91,000	325,000	5,164	.....	.....	.....	.....	.....	.....	.....	.....	.....	21,858,785	19,198,243	1885
1886	25,798,000	1,782,970	102,000	377,145	4,726	.....	.....	.....	.....	.....	.....	.....	.....	.....	28,064,841	19,996,313	1886
1887	22,356,193	5,022,632	145,000	678,572	4,791	76,295	.....	.....	.....	.....	.....	.....	.....	.....	28,283,483	18,877,094	1887
1888	16,488,668	10,010,868	119,448	690,333	5,096	297,612	.....	.....	.....	.....	.....	.....	.....	.....	27,612,025	17,947,620	1888
1889	21,487,435	12,471,466	544,113	303,220	5,400	316,476	33,375	1,460	500	48	20	.....	.....	.....	35,163,513	26,963,340	1889
1890	28,458,208	16,124,656	492,578	307,360	6,000	368,842	63,496	900	1,200	54	278	.....	.....	.....	45,823,572	35,365,105	1890
1891	33,009,236	17,740,301	2,406,218	323,600	9,000	655,482	136,634	675	1,400	54	25	30	.....	.....	54,292,655	30,529,553	1891
1892	28,422,377	16,362,921	3,810,086	385,049	6,500	824,000	136,634	521	5,000	45	10	80	.....	.....	50,514,657	25,906,463	1892
1893	20,314,513	16,249,769	8,445,412	470,179	3,000	594,390	2,335,293	400	18,000	50	50	10	.....	.....	48,431,066	28,950,326	1893
1894	19,019,990	16,792,154	8,577,624	705,969	1,500	515,746	3,688,666	300	40,000	60	8	130	2,369	.....	49,344,516	35,522,095	1894
1895	19,144,390	19,545,233	8,120,125	1,208,482	1,500	438,232	4,386,132	200	44,430	50	10	37	3,455	.....	52,892,276	57,632,296	1895
1896	20,584,421	23,941,169	10,019,770	1,252,777	1,680	361,450	4,680,732	250	113,571	1,450	43	170	2,878	.....	60,960,361	58,518,709	1896
1898	15,948,464	18,738,708	13,615,101	2,257,207	5,568	444,383	3,730,907	360	81,098	65,975	19	625	3,650	.....	60,475,516	40,874,072	1897
1897	19,262,066	21,560,515	13,090,045	1,903,411	322	384,934	4,122,356	500	71,980	546,070	10	.....	5,475	.....	55,364,233	44,193,359	1898
1899	14,374,512	21,142,108	13,910,630	2,642,095	18,280	390,278	3,848,182	360	69,700	669,013	132	.....	5,560	.....	57,070,850	64,603 904	1899
1900	14,559,127	22,362,730	16,195,675	4,324,484	62,259	317,385	4,874,392	200	74,714	836,039	[1]1,602	6,472	5,450	.....	63,620,529	75,989,313	1900
1901	13,831,996	21,648,083	14,177,126	8,786,330	137,259	460,520	5,757,086	250	179,151	4,393,658	[2]2,335	10,000	5,400	.....	69,389,194	66,417,335	1901
1902	13,183,610	21,014,231	13,513,345	13,984,268	185,331	396,901	7,480,896	200	331,749	18,083,658	[3]757	37,100	6,253	548,617	88,766,916	71,178,910	1902
1903	12,518,134	20,480,286	12,899,395	24,382,372	554,286	483,925	9,186,411	.....	932,214	17,955,572	[3]3,000	138,911	8,960	917,771	100,461,337	94,694,050	1903
1904	12,239,026	18,876,631	12,644,686	29,649,434	998,284	501,763	11,339,124	.....	4,250,779	22,241,413	[2]2,572	1,366,748	11,542	2,958,958	117,080,960	101,175,455	1904
1905	11,554,777	16,346,660	11,578,110	33,427,473	1,217,337	376,238	10,964,247	181,084	[2]12,013,495	28,136,189	[3]3,100	([3])	8,454	8,910,416	134,717,580	34,157,399	1905
1906	11,500,410	14,787,763	10,120,935	33,098,598	1,213,548	327,582	7,673,477	4,397,050	[2]21,718,648	12,567,897	[3]3,500	([3])	[4]7,000	9,077,528	126,493,936	92,444,735	1906
1907	11,211,606	12,207,448	9,095,296	39,748,375	820,844	331,851	5,128,037	24,281,973	2,409,521	12,322,696	[4]4,000	43,524,128	[5]9,339	5,000,221	166,095,335	120,106,749	1907
1908	10,584,453	10,858,797	9,523,176	44,854,737	[6]727,767	379,653	3,283,629	33,686,238	1,801,781	11,206,464	[4]15,246	45,798,765	[5]17,775	5,788,874	178,527,355	129,079,184	1908
1909	10,434,300	10,632,793	10,745,092	55,471,601	[6]639,016	310,861	2,296,086	30,898,339	1,263,764	9,534,467	[4]5,750	47,859,218	[5]20,056	3,059,531	183,170,874	128,328,487	1909
1910	9,848,500	9,916,370	11,753,071	73,010,560	[6]468,774	239,794	2,159,725	33,143,362	1,128,668	8,899,266	[4]3,615	52,028,718	[5]115,430	6,841,395	209,557,248	127,899,688	1910
1911	9,200,673	8,817,112	9,795,464	81,134,391	[6]472,458	226,926	1,695,289	31,317,038	1,278,819	9,526,474	[4]7,995	56,069,637	[5]186,695	10,720,420	220,449,391	134,044,752	1911
1912	8,712,076	[3]8,969,007	12,128,962	[7]87,272,593	[6]848,368	206,052	970,009	28 601,308	1,592,796	11,735,057	([8])	51,427,071	1,572,306	9,263,439	222,935,044	164,213,247	1912
1913	8,865,493	8,781,468	11,567,299	97,788,525	[6]524,568	188,568	956,095	23,893,899	2,375,029	15,009,478	[9]10,843	63,579,384	2,406,522	12,498,828	248,446,230	237,121,388	1913
1914	9,109,309	8,536,352	9,680,033	99,775,327	[6]502,441	222,773	1,335,456	21,919,749	3,103,585	20,068,184	[10]7,792	73,631,724	3,560,375	14,309,435	265,762,535	214,125,215	1914
1915	8,726,483	7,825,326	9,264,798	86,591,535	[6]437,274	208,475	875,758	19,041,695	2,823,487	24,942,701	[10]14,265	97,915,243	4,245,525	18,191,539	281,104,104	179,462,890	1915
1916	8,466,481	7,744,511	8,731,184	90,951,936	1,203.246	197,235	769,036	17,714,235	8,738,077	27,644,605	.....	107,071,715	6.234,137	15,248,138	300,767,158	330,899,868	1916
1917	8,612,885	7,750,540	8,379,285	93,877,549	3,100,356	121,231	759,432	15,776,860	36,536,125	32,413,287	.....	107,507,471	8,978,680	11,392,201	*335,315,601	522,635,213	1917
1918	8,216,655	7,285,005	7,866,628	97,531,997	4,376,342	143,286	877,558	13,365,974	45,451,017	38,750,031	.....	103,347,070	12,596,287	16,042,600	*355,927,716	703,943,961	1918
1919	9,441,936	8,243,592	9,032,688	101,221,784	5,027,904	241,680	929,780	12,436,000	34,769,100	85,312,000	.....	81,127,900	13,342,320	16,250,000	377,719,000	867,753,379	1919
Total	797,644,653	471,610,978	303,507,398	1,211,448,360	23,241,092	11,561,050	107,035,364	310,661,380	183,219,398	412,862,005	86,977	932,448,357	53,361,893	167,019,911	4,986,290,719	5,396,620,547	

*Includes Alaska, Michigan and Missouri production, estimated at 10,300 barrels in 1917 and 7,943 barrels in 1918. [1]Includes production of Michigan. [2]Includes production of Oklahoma. [3]Included with Kansas. [4]Estimated. [5]Includes production of Utah. [6]No. production in Tennessee recorded. [7]Includes small production in Alaska. [8]No production in Missouri; Michigan included in Ohio. [9]Includes production of Alaska, Michigan and New Mexico. [10]Includes production of Alaska and Michigan. Figures from United States Geological Survey, Department of Interior.

Total Production of Crude Oil in California

From the Beginning of the Industry to August 31, 1920, by Fields—in Barrels (42 U. S. Gallons)

Note.—The production figures in the tabulation below give the crude oil production of each field for each year since the beginning of the industry in the State. It is a history in figures of California's crude oil production and field development

Year	Kern River	McKittrick	Midway	Sunset	Coalinga	Santa Maria-Lompoc	Summerland	Newhall and Ventura Co.	Los Angeles and Salt Lake	Whittier-Fullerton	Lost Hills-Belridge	Miscellaneous	Total
Prior	.....	.....	.....	.....	.....	.....	.....	175,000	.....	.....	.....	.....	175,000
1876	.....	.....	.....	.....	.....	.....	.....	12,000	.....	.....	.....	.....	12,000
77	.....	.....	.....	.....	.....	.....	.....	13,000	.....	.....	.....	.....	13,000
78	.....	.....	.....	.....	.....	.....	.....	15,227	.....	.....	.....	.....	15,227
79	.....	.....	.....	.....	.....	.....	.....	19,858	.....	.....	.....	.....	19,858
1880	.....	.....	.....	.....	.....	.....	.....	40,552	.....	.....	.....	.....	40,552
81	.....	.....	.....	.....	.....	.....	.....	99,862	.....	.....	.....	.....	99,862
82	.....	.....	.....	.....	.....	.....	.....	128,636	.....	.....	.....	.....	128,636
83	.....	.....	.....	.....	.....	.....	.....	142,857	.....	.....	.....	.....	142,857
84	.....	.....	.....	.....	.....	.....	.....	262,000	.....	.....	.....	.....	262,000
85	.....	.....	.....	.....	.....	.....	.....	325,000	.....	.....	.....	.....	325,000
86	.....	.....	.....	.....	.....	.....	.....	377,145	.....	.....	.....	.....	377,145
87	.....	.....	.....	.....	.....	.....	.....	678,572	.....	.....	.....	.....	678,572
88	.....	.....	.....	.....	.....	.....	.....	690,333	.....	.....	.....	.....	690,333
89	.....	.....	.....	.....	.....	*	.....	303,220	.....	.....	.....	.....	303,220
1890	.....	.....	.....	.....	.....	.....	*	307,360	.....	.....	.....	.....	307,360
91	.....	.....	.....	*	.....	.....	.....	323,600	.....	.....	.....	.....	323,600
92	.....	*	.....	.....	.....	.....	.....	385,049	.....	.....	.....	.....	385,049
93	.....	.....	.....	.....	.....	.....	.....	470,179	.....	.....	.....	.....	470,179
94	.....	.....	.....	.....	.....	.....	1,500	524,469	257,109	.....	.....	.....	783,078
95	.....	.....	.....	.....	.....	.....	16,904	476,490	751,945	.....	.....	.....	1,245,339
96	.....	.....	.....	.....	14,119	.....	39,792	298,866	905,003	.....	.....	.....	1,257,780
97	.....	.....	.....	.....	70,140	.....	130,136	368,282	1,327,011	12,000	.....	4,000	1,911,569
98	.....	10,000	.....	.....	154,000	.....	132 217	427,000	1,462,871	60,000	.....	3,000	2,249,088
99	*	15,000	.....	.....	439,372	.....	208,370	496,200	1,409,356	108,077	.....	1,500	2,677,875
1900	826,775	80,000	*	12,500	547,960	.....	183,486	443,000	1,722,887	254,397	.....	248,945	4,319,950
01	3,278,840	430,450	4,235	188,600	525,433	*	203,616	472,057	2,304,432	302,652	.....	.....	7,710,315
02	8,988,046	619,296	3,048	167.558	571,233	86,888	143,552	475,000	2,198,496	1,103,793	.....	.....	14,356,910
03	16,342,099	1,353,206	27,305	352,565	2,138,058	204,890	131,125	682,185	793,765	2,305,613	.....	3,670	24,334,481
04	17,226,240	1,856,225	910	390,425	5,097,853	700,450	120,506	650,779	1,241,304	2,224,550	.....	39,392	29,548,634
05	15,253,845	1,373,030	18,530	419,212	8,882,125	3,402,800	96,871	476,898	2,226,768	2,118,312	.....	29,650	34,298,041
06	12,825,166	680,756	11,800	307,550	8,401,105	4,799,411	72,810	404,379	2,675,650	2,434,512	.....	10,090	32,623,229
07	12,346,014	2,415,840	149,944	704,805	8,996,268	8,249,236	69,060	435,584	3,372,465	3,294,206	.....	69,090	40,102,512
08	13,803,579	3,076,300	434,578	1,463,510	10,725,795	8,699,350	67,862	498,015	5,138,959	4,273,314	.....	125,475	48,306,737
09	14,508,242	5,807,360	2,234,455	1,999,701	15,406,619	8,017,455	66,338	516,628	4,350,898	5,157,252	.....	126,775	58,191,723
1910	14,776,435	5,471,613	11,174,207	9,218,904	18,646,570	7,607,830	74,725	652,575	3,729,618	6,281,221	4,900	58,970	77,697,568
11	14,078,890	5,477,532	21,584,602	5,559,069	18,311,251	7,465,074	71,255	661,785	3,223,661	7,081,165	168,410	61,350	83,744,044
12	12,446,445	5,094,465	25,948,980	5,590,824	19,546,122	6,801,966	65,715	859,885	3,073,427	7,919,779	2,680,961	45,870	90,074,439
13	9,980,940	4,496,842	33,040,129	5,984,651	18,604,626	5,817,711	62,406	1,022,052	2,898,846	10,657,053	5,274,553	27,375	97,867,184
14	7,030,545	3,820,857	37,479,228	12,546,615	15,925,887	4,303,080	55,743	968,421	2,504,475	14,130,548	4,830,921	27,375	103,623,695
15	8,034,974	3,552,801	33,311,486	6,006,607	13,548,159	4,536,840	53,000	1,036,305	2,110,133	13,030,549	4,318,550	27,375	89,566,779
16	8,402,525	3,230,644	32,156,818	6,768,658	14,381,493	4,422,410	56,775	1,122,033	1,721,453	14,679 672	4,852,431	27,450	91,822,362
17	8,495,610	3,252,544	29,487,812	7,072,333	15,938,543	5,789,070	56,570	1,186,407	1,501,799	18,155,440	6,295,329	27,375	97,267,832
18	7,921,515	3,050,627	27,439,993	6,608,940	16,283,066	7,143,750	54.613	1,386,518	1,397,781	24,903,613	5,420,079	27,375	101,637,870
19	7,563,025	2,810,848	26,414,067	5,589,885	16,385,610	6,030,916	53,680	1,792,463	1,341,415	28,657,683	4,554,821	27,375	101,221,784
20†	5,010,631	1,873,621	18,799,943	3,987,867	10,432,879	3,966,132	35,832	1,377,673	881,834	18,621,303	3,771,209	17,960	68,776,614
Total	219,140,381	59,849,857	299,722,070	80,940,779	239,974,286	98,054,253	2,324,459	24,481,401	56,523,361	187,766,704	42,172,164	1,037,437	1,311,986,882

*Indicates first well. †First 8 months. Figures except for 1920 from Standard Oil Bulletin.

THE YEAR'S WORK IN OTHER AMERICAN FIELDS

KANSAS

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	†	†	†	†	2,716,000
November	†	†	†	†	2,575,900
December	161	131	30	13,750	2,585,000
January	187	156	31	18,800	2,472,250
February	180	126	54	13,985	2,399,750
March	205	186	19	12,100	2,763,252
April	250	199	51	11,540	2,587,500
May	311	251	60	13,635	2,840,375
June	313	238	75	14,615	2,927,250
July	301	142	59	14,235	2,754,804
August	216	163	53	18,830	2,789,900
September	151	125	26	20,070	2,702,490
Totals	2,275	1,717	458	151,560	32,114,471

OKLAHOMA

October	†	†	†	†	6,158,000
November	†	†	†	†	6,320,600
December	489	355	134	31,770	6,399,000
January	461	349	112	34,890	6,769,750
February	570	422	148	41,975	6,737,663
March	693	567	126	59,010	7,354,750
April	720	554	166	53,745	7,374,750
May	893	697	196	83,385	7,877,875
June	749	589	160	85,660	7,649,610
July	709	548	161	69,300	8,089,365
August	752	590	162	80,692	8,689,457
September	629	527	102	62,160	8,993,220
Totals	6,665	5,198	1,467	602,587	88,414,040

ILLINOIS

October	34	29	5	450	1,064,000
November	33	23	10	350	1,033,000
December	21	14	7	320	926,000
January	22	13	9	235	887,000
February	20	15	5	240	831,000
March	21	18	3	375	992,000

ILLINOIS—Continued

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
April	28	17	11	260	884,000
May	35	27	8	365	935,000
June	53	31	22	900	931,000
July	36	27	9	565	925,000
August	37	22	15	690	927,000
September	46	34	12	520	*890,000
Totals	386	270	116	5,270	11,225,000

WYOMING

October	†	†	†	†	1,039,000
November	†	†	†	†	1,120,000
December	23	21	2	8,670	1,105,000
January	18	13	5	1,525	1,171,000
February	18	14	4	1,605	1,164,000
March	18	12	6	4,700	1,316 000
April	13	11	2	1,155	1,303,000
May	17	14	3	1,000	1,368,000
June	30	27	3	3,740	1,626,000
July	30	25	5	3,805	1,586,000
August	42	32	10	3,000	1,590,000
September	44	31	13	3,780	*1,600,000
Totals	253	200	53	32,980	15,988,000

KENTUCKY-TENNESSEE

October	329	307	22	8,000	650,000
November	379	319	60	5,220	700,000
December	270	235	35	4,750	484,000
January	210	190	20	4,610	476,400
February	197	167	30	3,105	499,300
March	230	211	19	5,800	610,000
April	284	255	29	9,000	717,000
May	270	241	29	9,865	768,000
June	303	272	31	8,730	754,000
July	191	168	23	8,110	749,000

KENTUCKY-TENNESSEE—Continued

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
August	261	236	25	9,800	755,000
September	235	220	15	7,500	*745,000
Totals	3,159	2,821	338	84,490	7,907,700

PENNSYLVANIA

October	†	†	†	†	657,400
November	†	†	†	†	580,000
December	452	372	80	2,345	550,000
January	330	264	66	2,500	534,000
February	289	245	44	1,480	529,000
March	315	273	42	2,300	666,000
April	440	360	80	2,740	636,000
May	476	395	81	2,485	651,000
June	525	435	90	3,175	648,000
July	545	430	115	3,750	650,000
August	601	498	103	4,865	652,000
September	594	484	110	4,430	*650,000
Totals	4,567	3,756	811	30,070	7,403,400

OHIO-INDIANA

October	190	134	56	3,000	595,000
November	164	134	30	3,780	600,000
December	151	130	21	2,000	603,000
January	117	90	27	2,560	598,000
February	87	47	40	1,815	567,000
March	156	107	49	3,025	722,000
April	194	157	37	3,500	685,000
May	174	129	45	3,790	708,000
June	251	190	61	4,285	734,000
July	197	159	38	4,325	736,000
August	222	163	59	2,220	738,000
September	260	198	62	3,200	*740,000
Totals	2,163	1,638	525	37,500	8,026,000

*Estimated.
†Figures not available.

Production of Texas by Fields

From 1895 to October 1, 1920

Year	Corsicana	Powell	Petrolia	Marion County	Wichita and Wilbarger Counties	Moran	Strawn	Coleman County	Eastland County	Stephens County	Desdemona	Brown County	Thrall	Miscellaneous
1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1896	1,450	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1897	65,975	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1898	544,620	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1899	668,483	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1900	829,560	5,479	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1901	763,424	37,121	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1902	571,079	46,812	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1903	401,817	100,143	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1904	374,318	129,329	65,455	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1905	312,595	131,051	101,651	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1906	336,387	675,842	111,072	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1907	276,311	596,897	83,260	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1908	211,117	398,649	82,639	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,525
1909	180,764	383,137	113,485	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,554
1910	137,331	450,188	126,531	251,717	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,656
1911	128,526	373,055	168,965	677,689	899,579	.....	.....	.....	.....	.....	.....	.....	.....	3,379
1912	233,282	251,240	197,421	362,870	4,227,104	.....	.....	.....	.....	.....	.....	.....	.....	4,062
1913	158,830	283,476	344,868	262,392	8,131,624	.....	.....	.....	.....	.....	.....	.....	.....	7,074
1914	133,811	282,279	550,585	180,584	8,227,951	68,191	.....	.....	.....	.....	.....	.....	.....	12,900
1915	143,275	237,410	349,857	123,464	5,833,386	109,116	50,498	.....	.....	.....	.....	.....	613,182	4,061
1916	135,263	215,729	302,145	64,971	7,837,386	135,608	175,147	.....	.....	.....	.....	.....	432,695	32,140
1917	131,828	196,855	282,420	57,952	9,541,636	68,118	340,950	.....	93,053	36,219	.....	6,040	176,887	111,220
1918	*361,980	.....	297,320	.....	12,159,032	54,900	185,520	31,253	3,107,120	790,243	.....	451,002	12,000	e130,000
1919	150,000	.....	212,624	**	30,279,108	32,500	101,300	46,590	22,379,665	10,514,216	7,375,825	213,256	8,200	235,075
1920†	400,000	.....	103,650	**	25,483,385	36,150	394,448	56,409	8,604,010	13,709,841	4,158,844	80,270	.....	36,740
T't'ls	7,652,026	4,794,692	3,553,948	1,981,639	112,561,951	504,583	1,247,863	134,252	34,183,848	25,050,519	11,534,669	750,838	1,242,964	912,232

*—Includes Powell. **—Figures not obtainable. e—Estimated. †—First nine months.

Year	Spindle Top	Sour Lake	Batson	Saratoga	Humble	Goose Creek	Orange County	Matagorda County	Damon Mound	Hull	Barbers Hill	West Columbia	Dayton	Blue Ridge and Other Pools	San Antonio District and Somerset
1901	3,593,113	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1902	17,420,949	44,338	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1903	8,600,905	8,848,159	4,518	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1904	3,433,842	6,442,357	10,904,737	739,239	.....	.....	.....	151,936	.....	.....	.....	.....	.....	.....	.....
1905	1,600,379	3,369,012	3,790,629	2,922,215	18,066,428	.....	.....	46,470	.....	.....	.....	.....	60,294	.....	.....
1906	1,075,755	2,156,010	2,388,238	2,289,057	3,570,845	.....	.....	8,000	.....	.....	.....	.....	192,460	.....	.....
1907	1,613,513	2,354,997	2,166,554	2,198,585	2,930,842	.....	.....	4,500	.....	.....	.....	.....	120,036	.....	.....
1908	1,747,537	1,595,060	1,593,570	1,634,786	3,778,521	.....	.....	62,640	.....	.....	.....	.....	39,901	31,185	.....
1909	1,388,170	1,703,798	1,206,214	1,183,559	3,237,060	.....	.....	29,103	.....	.....	.....	.....	17,647	87,039	.....
1910	1,182,436	1,518,723	1,113,767	1,024,348	2,495,511	.....	.....	455,999	.....	.....	.....	.....	9,582	129,497	.....
1911	965,939	1,364,880	1,023,493	925,777	2,426,220	.....	.....	561,828	.....	.....	.....	.....	4,344	2,800	.....
1912	822,916	1,175,108	844,563	1,116,655	1,829,923	43,808	.....	300,000e	.....	.....	.....	.....	12,151	1,044	.....
1913	716,374	1,348,053	741,350	937,720	1,504,880	249,641	17,706	294,553	.....	.....	.....	.....	13,329	1,620	.....
1914	580,130	5,209,208	775,804	889,743	2,799,458	134,748	43,208	164,192	.....	.....	.....	.....	18,791	1,780	.....
1915	388,266	4,114,622	703,686	864,266	11,061,802	119,336	21,697	137,481	.....	.....	.....	.....	10,378	47,254	.....
1916	340,441	4,923,332	744,915	781,128	10,925,805	397,291	17,758	158,336	.....	.....	.....	.....	8,571	43,921	.....
1917	308,039	4,763,004	692,417	682,797	7,389,831	7,300,279	7,023	128,011	.....	.....	.....	.....	9,995	159,245	.....
1918	502,265	3,115,033	654,950	790,740	5,645,104	9,419,132	3,425	99,540	486,640	330,300	20,000	136,350	7,442	40,000	58,400
1919	458,680	2,740,142	502,200	616,110	3,270,617	7,288,716	4,400e	53,260	434,700	1,476,405	169,415	8,128,809	1,000	24,910	94,100
1920†	235,495	1,586,845	356,259	572,996	2,641,514	4,052,171	3,000e	47,091	677,402	2,758,573	98,072	6,812,460	1,000	28,360	142,917
Total	46,975,144	58,372,681	30,207,855	20,169,721	83,574,361	28,978,122	113,817	2,703,300	1,598,742	4,565,278	287,487	15,077,619	526,921	598,655	295,417

e—Estimated.

The above table was compiled from the files of various oil companies, from the files of The OIL WEEKLY, the Oil Investors Journal, and from a year book issued by the Bureau of Mines, U. S. G. S.

TEXAS PRODUCTION PASSES 100,000,000 MARK

RANGER FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	88	81	7	48,147	2,082,868
November	68	59	9	34,900	1,871,436
December	54	43	11	25,050	1,650,750
January	98	86	12	28,850	1,585,550
February	74	57	17	12,400	1,321,675
March	68	57	11	9,857	1,137,612
April	87	73	14	14,160	947,700
May	86	73	13	20,920	900,700
June	51	32	19	6,488	899,190
July	50	39	11	7,491	781,913
August	53	20	33	4,850	549,250
September	45	29	16	2,110	482,190
Totals	822	649	173	215,223	14,210,828

DESDEMONA FIELD

October	77	70	7	31,000	979,850
November	78	70	8	22,400	1,044,480
December	62	55	7	26,100	1,015,312
January	76	64	12	12 260	608,950
February	112	80	32	11,700	527,800
March	82	68	14	4,248	426,622
April	95	77	18	4,385	501,160
May	87	57	30	7,692	437,379
June	82	37	45	1,692	435,600
July	83	47	36	3,730	477,015
August	69	42	27	1,202	379,068
September	48	33	15	1,181	365,250
Totals	951	700	251	127,590	7,198,486

STEPHENS COUNTY FIELD

October	53	49	4	94,072	1,292,875
November	37	33	4	18,900	1,240,140
December	55	43	12	15,250	1,253,950
January	53	44	9	12,800	1,119,000
February	72	60	12	26,500	1,001,275
March	64	53	11	21,800	954,645
April	72	58	14	14,100	992,700
May	123	97	26	50,910	1,245,890
June	77	60	17	25,500	1,605,600
July	152	115	37	38,806	1,956,937
August	148	95	53	44,161	2,411,614
September	121	92	29	33,017	2,422,230
Totals	1,027	799	228	395,816	17,496 806

STRAWN FIELD

October	6,000
November	19,500
December	19,800
January	15,190
February	9,425
March	28,100
April	80,000
May	62,000
June	69,000
July	51,959
August	39,804
September	38,970
Totals	439,748

MORAN FIELD

October	2,000
November	3,000
December	3,000
January	3,000
February	2,465
March	3 100
April	4,500
May	4,600
June	3,600
July	5,425
August	4,960
September	4,500
Totals	44,150

COLEMAN COUNTY FIELD

October	2	2	..	20	3,100
November	1	1	..	30	2,975
December	..	..	..	.....	3,800
January	..	..	..	.....	3,720
February	..	..	..	.....	2,460
March	..	..	..	.....	3,050
April	..	..	..	.....	2,500
May	..	..	..	.....	6,200
June	..	..	..	.....	15,000
July	3	2	1	50	8,000
August	6	6	..	101	6,092
September	4	2	2	35	9,387
Totals	16	13	3	236	66,284

BROWN COUNTY FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	1	..	1	.....	10,950
November	2	..	2	.....	10,050
December	..	..	..	.....	9,000
January	..	..	..	.....	8,680
February	..	..	..	.....	7,250
March	..	..	..	.....	9,300
April	..	..	..	.....	8,500
May	..	..	..	.....	9,000
June	..	..	..	.....	9,000
July	1	1	..	*	10,850
August	1	..	1	....	8,990
September	1	1	..	11	8,700
Totals	6	2	4	11	110,270

*Gas.

YOUNG COUNTY*

August	3	2	1	125	17 292
September	1	1	..	10	22,475
Totals	4	3	1	135	39,767

*Two months only.

TEXAS—BY FIELDS

CONDENSED SUMMARY

(October, 1919—September, 1920.)

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	822	649	173	215,223	14,210,828
Desdemona	951	700	251	127,590	7,198,486
Stephens Co.	1,027	799	228	395,816	17,496,806
Strawn	....	.....	.....	.....	439,748
Moran	....	.....	.....	.....	44,150
Coleman Co.	16	13	3	236	66,284
Brown Co.	6	2	4	11	110,270
Petrolia	8	3	5	70	147,750
Holliday	....	.....	.....	.....	43,995
Iowa Park	268	164	104	24,582	873,195
Electra	156	79	77	3,000	3,680,737.
Burkburnett	2,576	2,147	429	649,312	29,890,090
West Columbia	94	67	27	199,360	9,065,532
Hull	136	96	40	73,404	3,328,618
Humble	85	60	25	23,034	3,361,140
Somerset	76	76	.....	938	167,027
Goose Creek	106	74	32	28,978	5,559,337
Blue Ridge	12	5	7	1,630	35,870
Damon Mound	28	16	12	8,585	784,702
Saratoga	54	47	7	3,041	729,706
Sour Lake	37	28	9	2,009	2,197,712
Barbers Hill	21	8	13	1,707	176,897
Batson	28	24	4	756	488,659
Spindle Top	23	12	11	255	340,725
Markham	7	3	4	60	65,801
Young County	4	3	1	135	39,767
Wildcats	340	110	230	8,710	51,280
Total	6,877	5,182	1,695	1,768,307	100,595,112

PETROLIA FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	..	..	..	.....	15,800
November	1	1	..	*	16,100
December	2	1	1	35	12,000
January	..	..	..	.....	12,000
February	1	1	..	35	13,000
March	..	..	..	.....	13,000
April	..	..	..	.....	9,180
May	2	..	2	.....	13,020
June	1	..	1	.....	12,300
July	1	..	1	....	10,850
August	..	..	..	....	10,540
September	..	..	..	....	9,960
Totals	8	3	5	70	147,750

*Gas.

HOLLIDAY FIELD

October	3,000
November	3,100
December	3,000
January	1.200
February	1,975
March	1,500
April	3,600
May	6,975
June	6,300
July	5,270
August	3,875
September	4,200
Totals	43,995

IOWA PARK FIELD*

October	17	6	11	95	26,350
November	11	7	4	135	28,000
December	5	4	1	73	18,000
January	3	3	..	39	19,000
February	3	3	..	55	26,100
March	26	16	10	195	23,000
April	5	3	2	2,015	28,000
May	41	20	21	4,425	56,575
June	36	27	9	5,435	93,900
July	41	29	12	5,700	171,120
August	38	24	14	3,240	194,525
September	42	22	20	3,175	188,625
Totals	268	164	104	24,582	873,195

*Includes K-M-A.

BURKBURNETT FIELD

October	157	150	7	137,610	2.595,450
November	140	130	10	91,592	2,673,375
December	316	293	23	138,155	2,733,040
January	420	370	50	84,755	2,795,000
February	286	245	41	45,200	2,355,950
March	257	232	25	39,710	2,460,625
April	147	102	45	27,680	2,441,250
May	162	143	19	34,665	2,666,000
June	164	111	53	18,985	2,557,500
July	234	169	65	16,300	2,356,000
August	154	99	55	8,190	2,197,900
September	139	103	36	6,470	2,058,000
Totals	2,576	2,147	429	649,312	29,890,090

ELECTRA FIELD

October	20	9	11	320	308,197
November	16	5	11	245	313,120
December	6	..	6	.....	300,000
January	7	2	5	20	324,900
February	18	10	8	210	290,725
March	11	5	6	200	301,475
April	7	5	2	125	236,500
May	22	16	6	730	325,500
June	7	5	2	130	311,250
July	18	11	7	645	328,910
August	14	7	7	275	327,050
September	10	4	6	100	313,110
Totals	156	79	77	3,000	3,680,737

WEST COLUMBIA FIELD

October	9	5	4	17,450	934,892
November	5	5	..	10,850	685,650
December	9	4	5	16,950	632,530
January	5	4	1	53,000	874,634
February	8	2	6	8,500	501,700
March	3	3	..	15,500	579,312
April	11	11	..	23,930	627,180
May	8	5	3	8,300	709,055
June	7	6	1	990	524,700
July	14	13	1	32,695	734,390
August	8	6	2	8,610	1,401,277
September	7	3	4	2,585	860,212
Totals	94	67	27	199,360	9,065,532

TEXAS PRODUCTION SHOWN BY FIELDS

(Year ending September, 30, 1920)

HULL FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	8	3	5	2,230	137,330
November	5	4	1	6,200	195,720
December	9	3	6	2,050	236,995
January	4	4	..	1,225	208,785
February	11	6	5	6,360	214,890
March	14	8	6	3,285	366,110
April	12	9	3	8,975	284,240
May	14	8	6	5,825	259,860
June	15	9	6	5,840	299,700
July	18	17	1	8,969	322,663
August	13	12	1	8,890	368,900
September	13	13	..	13,555	433,425
Totals	136	96	40	73,404	3,328,618

HUMBLE FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	8	3	5	415	245,916
November	7	6	1	1,055	220,440
December	5	1	4	20	253,270
January	5	5	..	320	223,200
February	5	2	3	20	197,780
March	7	6	1	11,390	324,074
April	5	4	1	150	285,860
May	10	7	3	4,712	270,723
June	10	7	3	240	258,300
July	13	11	2	4,433	255,223
August	6	6	..	263	386,492
September	4	2	2	16	439,862
Totals	85	60	25	23,034	3,361,140

SOMERSET (S. A. DISTRICT) FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	1	1	..	3	9,100
November	3	3	..	85	8,500
December	1	1	..	7	6,510
January	6	6	..	45	6,821
February	6	6	..	61	7,975
March	1	1	..	5	10,664
April	9	9	..	48	13,110
May	13	13	..	118	14,260
June	8	8	..	110	15,300
July	11	11	..	134	18,800
August	10	10	..	211	26,737
September	7	7	..	111	29,250
Totals	76	76	..	938	167,027

GOOSE CREEK FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	11	4	7	1,200	571,696
November	10	6	4	1,230	459,000
December	8	5	3	412	476,470
January	10	7	3	1,120	455,638
February	7	4	3	285	414,030
March	5	2	3	65	391,530
April	8	4	4	268	432,300
May	10	8	2	3,350	418,655
June	6	5	1	4,205	451,110
July	11	10	1	5 208	515,809
August	7	7	..	6,250	470,577
September	13	12	1	5,385	502,522
Totals	106	74	32	28,978	5,559,337

BLUE RIDGE FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	..	..	..	.....	2,325
November	..	..	..	.....	2,550
December	1	..	1	.....	2,635
January	1	..	1	.....	2,630
February	1	1	..	20	2,030
March	..	..	..	.....	2,170
April	2	..	2	.....	1,950
May	1	1	..	600	1,860
June	3	2	1	850	4,200
July	3	1	2	160	6,200
August	..	..	..	....	3,720
September	..	..	..	....	3,600
Totals	12	5	7	1,630	35,870

DAMON MOUND FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	2	..	2	.....	37,200
November	1	1	..	150	36,000
December	1	..	1	.....	34,100
January	3	1	2	100	31,000
February	5	2	3	5,100	29,000
March	4	2	2	1,060	36,037
April	4	3	1	375	132,000
May	3	3	..	400	121,600
June	..	..	..	.....	100,500
July	2	2	..	250	78,040
August	1	1	..	150	78,350
September	2	1	1	1,000	70,875
Totals	28	16	12	8,585	784,702

SARATOGA FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	3	1	2	15	52,700
November	1	..	1	.....	51,000
December	1	1	..	15	53,010
January	2	2	..	85	54,250
February	1	..	1	.....	49,880
March	4	4	..	215	58,652
April	3	3	..	38	51,660
May	7	7	..	220	54,250
June	8	7	1	280	61,500
July	9	7	2	693	64,604
August	7	7	..	799	83,700
September	8	8	..	681	94,500
Totals	54	47	7	3,041	729,706

SOUR LAKE FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	3	2	1	40	242,970
November	4	3	1	50	181,680
December	2	1	1	10	186,217
January	1	1	..	75	182,063
February	3	3	..	25	180,380
March	3	3	..	115	181,892
April	2	..	2	.....	157,080
May	4	3	1	1,340	174,220
June	7	5	2	165	177,000
July	2	2	..	49	177,785
August	3	3	..	105	179,800
September	3	2	1	35	176,625
Totals	37	28	9	2,009	2,197,712

BARBERS HILL FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	3	2	1	750	27,125
November	1	1	..	150	30,000
December	1	..	1	.....	21,700
January	1	..	1	.....	15,500
February	2	..	2	.....	9,787
March	..	..	..	.....	5,425
April	..	..	..	.....	6,000
May	2	1	1	200	9,300
June	1	1	..	100	11,250
July	5	2	3	57	11,987
August	2	..	2	....	10,261
September	3	1	2	450	18,562
Totals	21	8	13	1,707	176,897

BATSON FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	..	..	..	.....	44,000
November	1	..	1	.....	45,000
December	1	..	1	.....	43,400
January	..	..	..	.....	35,650
February	..	..	..	.....	32,480
March	..	..	..	.....	38,161
April	1	1	..	5	37,200
May	5	3	2	90	39,060
June	6	6	..	46	36,000
July	5	5	..	427	44,658
August	3	3	..	117	48,050
September	6	6	..	71	45,000
Totals	28	24	4	756	488,659

SPINDLE TOP FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	2	..	2	.....	34,100
November	2	1	1	30	33,000
December	1	1	..	20	38,130
January	3	1	2	10	32,550
February	..	..	..	.....	24,650
March	2	1	1	10	25,420
April	3	1	2	50	25,500
May	2	..	2	.....	24,800
June	..	..	..	.....	23,700
July	3	2	1	40	25,923
August	1	1	..	15	25,952
September	4	4	..	100	27,000
Totals	23	12	11	255	340,725

MARKHAM FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	..	..	..	.....	6,200
November	1	..	1	.....	6,000
December	1	..	1	.....	6,510
January	..	..	..	.....	6,290
February	..	..	..	.....	4,350
March	1	..	1	.....	4,526
April	1	..	1	.....	4,500
May	..	..	..	.....	4,495
June	2	2	..	35	4,500
July	..	..	..	.....	6,200
August	1	1	..	25	6,350
September	..	..	..	....	6,150
Totals	7	3	4	60	65,801

TEXAS WILDCATS

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	17	6	11	575	3,500
November	19	8	11	833	8,000
December	19	6	13	28	3,040
January	12	6	6	235	3,000
February	20	7	13	1,152	5,000
March	29	10	19	1,390	5,000
April	36	13	23	1,510	3,200
May	35	12	23	406	7,000
June	31	11	20	705	3,000
July	43	12	31	1,300	10,540
August	33	6	27	127	.....
September	46	13	33	449	.....
Totals	340	110	230	8,710	51,280

TEXAS—BY MONTHS

(Year ending September 30, 1920)

CONDENSED SUMMARY BY MONTHS

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	482	394	88	333,942	9,675 494
November	413	344	69	188,835	9,187,810
December	560	462	98	224,175	9,016,169
January	710	606	104	194,939	8,628,201
February	635	489	146	117,623	7,262,195
March	581	471	110	109,045	7,391,002
April	510	376	134	97,814	7,317,370
May	637	477	160	144,903	7,842,977
June	522	341	181	71,796	7,989,000
July	722	508	214	127,137	8,377,071
August	578	356	222	87,581	9,241,135
September	527	359	168	70,547	8,655,885
Total	6,877	5,183	1,694	1,768,337	100,595,112

MONTH OF OCTOBER

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	88	81	7	48,147	2,082,868
Desdemona	77	70	7	31,000	979,850
Stephens	53	49	4	94,072	1,292,875
Strawn	..	..	..	.....	6,000
Moran	..	..	..	.....	2,000
Coleman	2	2	..	20	3,100
Brown	1	..	1	.....	10,950
Petrolia	..	..	..	.....	15,800
Holliday	..	..	..	.....	3,000
Iowa Park	17	6	11	95	26,350
Burkburnett	157	150	7	137,610	2,595,450
Electra	20	9	11	320	308,197
West Columbia	9	5	4	17,450	934,892
Hull	8	3	5	2,230	137,330
Humble	8	3	5	415	245,916
San Antonio District	1	1	..	3	9,100
Goose Creek	11	4	7	1,200	571,696
Blue Ridge	..	..	..	.....	2,325
Damon Mound	2	..	2	.....	37,200
Saratoga	3	1	2	15	52,700
Sour Lake	3	2	1	40	242,970
Barbers Hill	3	2	1	750	27,125
Batson	..	..	..	.....	44,000
Spindle Top	2	..	2	.....	34,100
Markham	..	..	..	.....	6,200
Wildcats	17	6	11	575	3,500
Total	482	394	88	333,942	9,675,394

MONTH OF NOVEMBER

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	68	59	9	34,900	1,871,430
Desdemona	78	70	8	22,400	1,044,480
Stephens	37	33	4	18,900	1,240,140
Strawn	..	..	..	.....	19,500
Moran	..	..	..	.....	3,000
Coleman	1	1	..	30	2,975
Brown	2	..	2	.....	10,050
Petrolia	1	1	..	gas	16,100
Holliday	..	..	..	.....	3,100
Iowa Park	11	7	4	135	28,000
Burkburnett	140	130	10	91,592	2,673,375
Electra	16	5	11	245	313,120
West Columbia	5	5	..	10,850	685,650
Hull	5	4	1	6,200	195,720
Humble	7	6	1	1,055	220,440
San Antonio Dist	3	3	..	85	8,500
Goose Creek	10	6	4	1,230	459,000
Blue Ridge	..	..	..	.....	2,550
Damon Mound	1	1	..	150	36,000
Saratoga	1	..	1	.....	51,000
Sour Lake	4	3	1	50	181,680
Barbers Hill	1	1	..	150	30,000
Batson	1	..	1	.....	45,000
Spindle Top	2	1	1	30	33,000
Markham	..	..	..	.....	6,000
Wildcats	19	8	11	833	8,000
Totals	413	344	69	188,835	9,187,810

TEXAS PRODUCTION SHOWN BY MONTHS

(Year ending September, 30, 1920)

MONTH OF DECEMBER

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	54	43	11	25,050	1,650,750
Desdemona	62	55	7	26,100	1,015,312
Stephens	55	43	12	15,250	1,253,950
Strawn	..	..	..	.....	19,800
Moran	..	..	..	.....	3,000
Coleman	..	..	..	.....	3,800
Brown	..	..	..	.....	9,000
Petrolia	2	1	1	35	12,000
Holliday	..	..	..	.....	3,000
Iowa Park	5	4	1	73	18,000
Burkburnett	316	293	23	138,155	2,733,040
Electra	6	..	6	.....	300,000
West Columbia	9	4	5	16,950	632,530
Hull	9	3	6	2,050	236,995
Humble	5	1	4	20	253,270
San Antonio Dist.	1	1	..	7	6,510
Goose Creek	8	5	3	412	476,470
Blue Ridge	1	..	1	.....	2,635
Damon Mound	1	..	1	.....	34,100
Saratoga	1	1	..	15	53,010
Sour Lake	2	1	1	10	186,217
Barbers Hill	1	..	1	.....	21,700
Batson	1	..	1	.....	43,400
Spindle Top	1	1	..	20	38,130
Markham	1	..	1	.....	6,510
Wildcats	19	6	13	28	3,040
Totals	560	462	98	224,175	9,131,369

MONTH OF JANUARY

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	98	86	12	28,850	1,585,550
Desdemona	76	64	12	12,260	608,950
Stephens	53	44	9	12,800	1,119,000
Strawn	..	..	..	.....	15,190
Moran	..	..	..	.....	3,000
Coleman	..	..	..	.....	3,720
Brown	..	..	..	.....	8,680
Petrolia	..	..	..	.....	12,000
Holliday	..	..	..	.....	1,200
Iowa Park	3	3	..	39	19,000
Burkburnett	420	370	50	84,755	2,795,000
Electra	7	2	5	20	324,900
West Columbia	5	4	1	53,000	874,634
Hull	4	4	..	1,225	208,785
Humble	5	5	...	320	223 200
San Antonio Dist.	6	6	..	45	6,821
Goose Creek	10	7	3	1,120	455,638
Blue Ridge	1	..	1	.....	2,630
Damon Mound	3	1	2	100	31,000
Saratoga	2	2	..	85	54,250
Sour Lake	1	1	..	75	182,063
Barbers Hill	1	..	1	.....	15,500
Batson	..	..	..	.....	35,650
Spindle Top	3	1	2	10	32,550
Markham	..	..	..	.....	6,290
Wildcats	12	6	6	235	3,000
Totals	710	606	104	194,939	8,628,201

MONTH OF FEBRUARY

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	74	57	17	12,400	1,321,675
Desdemona	112	80	32	11,700	527,800
Stephens	72	60	12	26,500	1,001,225
Strawn	..	..	..	.....	9,425
Moran	..	..	..	.....	2,465
Coleman	..	..	..	.....	2,460
Brown	..	..	..	.....	7,250
Petrolia	1	1	..	35	13,000
Holliday	..	..	..	.....	1,975
Iowa Park	3	3	..	55	26,100
Burkburnett	286	245	41	45,200	2,335,950
Electra	18	10	8	210	290,725
West Columbia	8	2	6	8,500	501,700
Hull	11	6	5	6,360	214,890
Humble	5	2	3	20	197,780
San Antonio Dist.	6	6	..	61	7,975
Goose Creek	7	4	3	285	414,030
Blue Ridge	1	1	..	20	2,030
Damon Mound	5	2	3	5,100	29,000
Saratoga	1	..	1	.....	49,880
Sour Lake	3	3	..	25	180,380
Barbers Hill	2	..	2	.....	58,000
Batson	..	..	..	.....	32,480
Spindle Top	..	..	..	.....	24,650
Markham	..	..	..	.....	4,350
Wildcats	20	7	13	1,152	5,000
Totals	635	489	146	117,623	7,262,195

MONTH OF MARCH

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	68	57	11	9,857	1,137,612
Desdemona	82	68	14	4,248	426,622
Stephens	64	53	11	21,800	954,645
Strawn	..	..	..	.....	28,100
Moran	..	..	..	.....	3,100
Coleman	..	..	..	.....	3,050
Brown	..	..	..	.....	9,300
Petrolia	..	..	..	.....	13,000
Holliday	..	..	..	.....	1,500
Iowa Park	26	16	10	195	23,000
Burkburnett	257	232	25	39,710	2,460,625

MARCH—Continued

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Electra	11	5	6	200	301,475
West Columbia	3	3	..	15,500	579,312
Hull	14	8	6	3,285	366,110
Humble	7	6	1	11,390	324,074
San Antonio Dist.	1	1	..	5	10,664
Goose Creek	5	2	3	65	391,530
Blue Ridge	..	..	..	.....	2,170
Damon Mound	4	2	2	1,060	36,037
Saratoga	4	4	..	215	58,652
Sour Lake	3	3	..	115	181,892
Barbers Hill	..	..	..	.....	5,425
Batson	..	..	..	.....	38,161
Spindle Top	2	1	1	10	25,420
Markham	1	..	1	.....	4,526
Wildcats	29	10	19	1.390	5,000
Totals	581	471	110	109,045	7,391,002

MONTH OF APRIL

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	87	73	14	14,160	947,700
Desdemona	95	77	18	4,385	501,160
Stephens	72	58	14	14,100	992,700
Strawn	..	..	..	.....	80,000
Moran	..	..	..	.....	4,500
Coleman	..	..	..	.....	2,500
Brown	..	..	..	.....	8,500
Petrolia	..	..	..	.....	9,180
Holliday	..	..	..	.....	3,600
Iowa Park	5	3	2	2,015	28,000
Burkburnett	147	102	45	27,680	2,441,250
Electra	7	5	2	125	236,500
West Columbia	11	11	..	23,930	627,180
Hull	12	9	3	8,975	284,240
Humble	5	4	1	150	285,860
San Antonio Dist.	9	9	..	48	13,110
Goose Creek	8	4	4	268	432,300
Blue Ridge	2	..	2	.....	1,950
Damon Mound	4	3	1	375	132,000
Saratoga	3	3	..	38	51,660
Sour Lake	2	..	2	.....	157,080
Barbers Hill	..	..	..	.....	6,000
Batson	1	1	..	5	37,200
Spindle Top	3	1	2	50	25,500
Markham	1	..	1	.....	4,500
Wildcats	36	13	23	1,510	3.200
Totals	510	376	134	97,814	7,317,370

MONTH OF MAY

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	86	73	13	20,920	900,700
Desdemona	87	57	30	7,692	437,379
Stephens	123	97	26	50,910	1,245,890
Strawn	..	..	..	.....	62,000
Moran	..	..	..	.....	4,600
Coleman	..	..	..	.....	6,700
Brown	..	..	..	.....	9,000
Petrolia	2	..	2	.....	13,020
Holliday	..	..	..	.....	6,975
Iowa Park	41	20	21	4,425	56.575
Burkburnett	162	143	19	34,665	2,666,000
Electra	22	16	6	730	325,500
West Columbia	8	5	3	8,300	709,055
Hull	14	8	6	5,825	259,860
Humble	10	7	3	4,712	270,723
San Antonio Dist.	13	13	..	118	14,260
Goose Creek	10	8	2	3,350	418,655
Blue Ridge	1	1	..	600	1,860
Damon Mound	3	3	..	400	121,600
Saratoga	7	7	..	220	54,250
Sour Lake	4	3	1	1,340	174,220
Barbers Hill	2	1	1	200	9,300
Batson	5	3	2	90	39,060
Spindle Top	2	..	2	.....	24,800
Markham	..	..	..	.....	4,495
Wildcats	35	12	23	406	7,000
Totals	637	477	160	144,903	7,842,957

MONTH OF JUNE

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	51	32	19	6,488	899,190
Desdemona	82	37	45	1,692	435,600
Stephens	77	60	17	25,500	1,605,600
Strawn	..	..	..	.....	69,000
Moran	..	..	..	.....	3,600
Coleman	..	..	..	.....	15,000
Brown	..	..	..	.....	9,000
Petrolia	1	..	1	.....	12,300
Holliday	..	..	..	.....	6,300
Iowa Park	36	27	9	5,435	93,900
Burkburnett	164	111	53	18,985	2,557,500
Electra	7	5	2	130	311,250
West Columbia	7	6	1	990	524,700
Hull	15	9	6	5,840	299,700
Humble	10	7	3	240	258,300
San Antonio Dist.	8	8	..	110	15,300
Goose Creek	6	5	1	4,205	451,110
Blue Ridge	3	2	1	850	4,200
Damon Mound	..	..	..	.....	100,500
Saratoga	8	7	1	280	61,500

JUNE—Continued

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Sour Lake	7	5	2	165	177,000
Barbers Hill	1	1	..	100	11,250
Batson	6	6	..	46	36,000
Spindle Top	..	..	..	.....	23,700
Markham	2	2	..	35	4,500
Wildcats	31	11	20	705	3,000
Totals	522	341	181	71,796	7,989,000

MONTH OF JULY

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	50	39	11	7,491	781,913
Desdemona	83	47	36	3,730	477,015
Stephens	152	115	37	38,806	1,956,937
Strawn	..	..	..	.....	51,959
Moran	..	..	..	.....	5,425
Coleman	3	2	1	50	8,000
Brown	1	1	..	gas	10,850
Petrolia	1	..	1	.....	10,850
Holliday	..	..	..	.....	,5270
Iowa Park	41	29	12	5,700	171,120
Burkburnett	234	169	65	16,300	2,356,000
Electra	18	11	7	645	328,910
West Columbia	14	13	1	32,695	734,390
Hull	18	17	1	8,969	322,663
Humble	13	11	2	4,433	255,223
San Antonio Dist.	11	11	..	134	18,800
Goose Creek	11	10	1	5,208	515,809
Blue Ridge	3	1	2	160	6,200
Damon Mound	2	2	..	250	78,040
Saratoga	9	7	2	693	64,604
Sour Lake	2	2	..	49	117,785
Barbers Hill	5	2	3	57	11,987
Batson	5	5	..	427	44,658
Spindle Top	3	2	1	40	25,923
Markham	..	..	..	.....	6,200
Wildcats	43	12	31	1,300	10,540
Totals	722	508	214	127,137	8,958,471

MONTH OF AUGUST

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	53	20	33	4,850	549,250
Desdemona	69	42	27	1,202	379,068
Stephens	148	95	53	44,161	2,411,614
Strawn	..	..	..	.....	39,804
Moran	..	..	..	.....	4,960
Coleman	6	6	..	101	6,092
Brown	1	..	1	.....	8,999
Petrolia	..	..	..	.....	10,540
Holliday	..	..	..	.....	3,875
Iowa Park	38	24	14	3,240	194,525
Burkburnett	154	99	55	8,190	2,197,900
Electra	14	7	7	275	327,050
West Columbia	8	6	2	8,610	1,401,277
Hull	13	12	1	8,890	368,900
Humble	6	6	..	263	386,492
San Antonio District.	10	10	..	211	26,737
Goose Creek	7	7	..	6,250	470,577
Blue Ridge	..	..	..	.....	3,720
Damon Mound	1	1	..	150	78,350
Saratoga	7	7	..	799	83,700
Sour Lake	3	3	..	105	179,800
Barbers Hill	2	..	2	.....	10,261
Batson	3	3	..	117	48,050
Spindle Top	1	1	..	15	25,952
Markham	1	1	..	25	6,350
Young County	3	2	1	125	17,292
Wildcats	33	6	27	127	.....
Totals	578	356	222	87,581	9,223,836

MONTH OF SEPTEMBER

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Ranger	45	29	16	2,110	480,420
Desdemona	48	33	15	1.181	365,250
Stephens	121	92	29	33,017	2,422,230
Strawn	..	..	..	....	38,970
Moran	..	..	..	....	4,500
Coleman	4	2	2	35	9,387
Brown	1	1	..	11	8,700
Petrolia	..	..	..	....	9,960
Holliday	..	..	..	....	4,200
Iowa Park	42	22	20	3,175	188,625
Burkburnett	139	103	36	6,470	2,058,000
Electra	10	4	6	100	313,110
Young County	1	1	..	10	22,475
West Columbia	7	3	4	2,585	860,212
Hull	13	13	..	13,555	433,425
Humble	4	2	2	16	439,862
San Antonio District.	7	7	..	111	29,250
Goose Creek	13	12	1	5,385	502,522
Blue Ridge	..	..	..	.....	3,600
Damon Mound	2	1	1	1,000	70,875
Saratoga	8	8	..	681	94,500
Sour Lake	3	2	1	35	176,625
Barbers Hill	3	1	2	450	18,562
Batson	6	6	..	71	45,000
Spindle Top	4	4	..	100	27,000
Markham	..	..	..	....	6,150
Wildcats	46	13	33	449	.....
Totals	527	359	168	70,547	8,633,410

LOUISIANA PRODUCTION FIGURES FOR YEAR

MONTH OF OCTOBER

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Edgerly	1	1	..	100	37,200
Vinton	6	2	4	300	127,100
Evangeline	..	..	..	.....	30,100
Claiborne	22	17	5	81,600	214,055
Bull Bayou	25	25	..	23,430	641,235
Caddo	32	29	3	2,995	738,885
Wildcats	3	2	1	gas	.....
Totals	89	76	13	108,425	1,761,575

MONTH OF NOVEMBER

Edgerly	..	..	..	.....	34,500
Vinton	5	2	3	165	123,000
Evangeline	..	..	..	.....	24,450
Claiborne	19	18	1	120,850	182,700
Bull Bayou	12	12	..	6,635	595,910
Caddo	6	4	2	110	604,345
Wildcats	3	2	1	20	.....
Totals	45	38	7	127,780	1,564,905

MONTH OF DECEMBER

Edgerly	..	..	..	.....	38,750
Vinton	4	2	2	160	119,050
Evangeline	..	..	..	.....	25,000
Claiborne	27	22	5	96,400	274,075
Bull Bayou	24	23	1	10,830	618,750
Caddo	5	5	..	250	652,735
Wildcats	5	4	1	*	.....
Totals	65	56	9	107,640	1,728,360

*Gas.

MONTH OF JANUARY

Edgerly	..	..	..	.....	34,875
Vinton	3	3	..	90	122,450
Evangeline	..	..	..	.....	24,500
Claiborne	28	27	1	190,490	1,041,565
Bull Bayou	27	25	2	5,370	667,900
Caddo	6	6	..	460	596,485
Wildcats	7	2	5	gas	.....
Totals	71	63	8	196,410	2,487,755

MONTH OF FEBRUARY

Edgerly	2	1	1	75	38,250
Vinton	2	1	1	150	116,300
Evangeline	..	..	..	.....	22,900
Claiborne	40	38	2	129,470	2,145,352
Bull Bayou	22	22	..	5,200	535,848
Caddo	6	4	2	300	528,699
Wildcats	1	1	..	gas	.....
Totals	73	67	6	135,195	3,387,349

MONTH OF MARCH

Edgerly	1	1	..	1,000	31,465
Vinton	3	2	1	115	122,140
Evangeline	1	..	1	.....	21,979
Claiborne	36	28	8	33,970	2,441,250
Bull Bayou	21	20	1	10,010	549,072
Caddo	7	6	1	550	548,700
Wildcats	9	5	4	18	.....
Totals	78	62	16	45,663	3,714,606

MONTH OF APRIL

Edgerly	1	1	..	200	52,560
Vinton	1	1	..	25	108,810
Evangeline	..	..	..	.....	19,800
Claiborne	44	37	7	32,500	2,596,500
Bull Bayou	44	40	4	25,815	621,375
Caddo	4	4	..	140	489,000
Wildcats	8	2	6	28	.....
Totals	102	85	17	58,708	3,888,045

MONTH OF MAY

Edgerly	2	2	..	305	36,270
Vinton	2	2	..	150	100,050
Evangeline	1	1	..	5	20,770
Claiborne	93	71	22	45,803	2,609,270
Bull Bayou	45	40	5	19,320	691,270
Caddo	24	20	4	840	529,480
Wildcats	20	9	11	30	50
Totals	187	145	42	66,455	4,033,480

CONDENSED SUMMARY BY FIELDS
(October, 1919—September, 1920.)

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Edgerly	15	13	2	3,285	468,437
Vinton	43	27	16	3,032	1,333,237
Evangeline	6	5	1	195	262,914
Claiborne	547	425	122	802,348	19,806,194
Bull Bayou	366	327	39	120,615	6,978,074
Caddo	149	124	25	8,660	6,731,200
Wildcats	121	57	64	2,372	5,050
Totals	1,247	978	269	940,507	35,585,206

CONDENSED SUMMARY BY MONTHS

October	89	76	13	108,425	1,788,575
November	45	38	7	127,780	1,564,905
December	65	56	9	107,640	1,728,360
January	71	63	8	196,410	2,487,755
February	73	67	6	135,195	3,387,349
March	78	62	16	45,663	3,714,606
April	102	85	17	58,708	3,888,045
May	187	145	42	66,455	3,987,160
June	134	103	31	33,252	3,598,740
July	157	115	42	31,382	3,300,510
August	133	89	44	16,159	3,206,894
September	113	80	33	13,440	2,932,287
Totals	1,247	979	268	940,509	35,604,506

MONTH OF JUNE

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
Edgerly	2	2	..	420	34,500
Vinton	3	3	..	250	104,340
Evangeline	1	1	..	5	18,900
Claiborne	69	51	18	29,005	2,354,250
Bull Bayou	29	25	4	1,960	588,750
Caddo	11	11	..	520	493,000
Wildcats	19	10	9	1,092	5,000
Totals	134	103	31	33,252	3,598,740

MONTH OF JULY

Edgerly	5	4	1	785	42,100
Vinton	6	3	3	852	100,130
Evangeline	..	..	..	.....	21,305
Claiborne	70	46	24	22,100	2,118,075
Bull Bayou	45	40	5	6,075	518,250
Caddo	17	13	4	755	500,650
Wildcats	14	9	5	815	.....
Totals	157	115	42	31,382	3,300,510

MONTH OF AUGUST

Edgerly	..	..	..	....	40,687
Vinton	6	4	2	525	99,687
Evangeline	2	2	..	135	14,260
Claiborne	53	39	14	11,490	2,025,850
Bull Bayou	37	27	10	2,935	500,464
Caddo	17	13	4	870	525,946
Wildcats	18	4	14	204	.....
Totals	133	89	44	16,159	3,206,894

MONTH OF SEPTEMBER

Edgerly	1	1	..	400	47,280
Vinton	2	2	..	250	90,180
Evangeline	1	1	..	50	19,050
Claiborne	46	31	15	8,670	1,803,252
Bull Bayou	35	29	6	3,035	449,250
Caddo	14	9	5	870	523,275
Wildcats	14	7	7	165	.....
Totals	113	80	33	13,440	2,932,287

SUMMARY BY FIELDS

EDGERLY FIELD

	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	1	1	..	100	37,200
November	..	..	..	.....	34,500
December	..	..	..	.....	38,750
January	..	..	..	.....	34,875
February	2	1	1	75	38,250
March	1	1	..	1,000	31,465
April	1	1	..	200	52,560
May	2	2	..	305	36,270
June	2	2	..	420	34,500
July	5	4	1	785	42,100
August	..	..	..	....	40,687
September	1	1	..	400	47,280
Totals	15	13	2	3,285	468,437

VINTON FIELD

October	6	2	4	300	127,100
November	5	2	3	165	123,000
December	4	2	2	160	119,050
January	3	3	..	90	122,450
February	2	1	1	150	116,300
March	3	2	1	115	122,140
April	1	1	..	25	108,810
May	2	2	..	150	100,050
June	3	3	..	250	104,340
July	6	3	3	852	100,130
August	6	4	2	525	99,687
September	2	2	..	250	90,180
Totals	43	27	16	3,032	1,333,237

EVANGELINE FIELD

October	..	..	..	.....	30,000
November	..	..	..	.....	24,450
December	..	..	..	.....	25,000
January	..	..	..	.....	24,500
February	..	..	..	.....	22,900
March	1	..	1	.....	21,979
April	..	..	..	.....	19,800
May	1	1	..	5	20,770
June	1	1	..	5	18,900
July	..	..	..	.....	21,305
August	2	2	..	135	14,260
September	1	1	..	50	19,050
Totals	6	5	1	195	262,914

CLAIBORNE FIELD

October	22	17	5	81,600	214,055
November	19	18	1	120,850	182,700
December	27	22	5	96,400	274,075
January	28	27	1	190,490	1,041,565
February	40	38	2	129,470	2,145,352
March	36	28	8	33,970	2,441,250
April	44	37	7	32,500	2,596,500
May	93	71	22	45,803	2,609,270
June	69	51	18	29,005	2,354,250
July	70	46	24	22,100	2,118,075
August	53	39	14	11,490	2,025,850
September	46	31	15	8,670	1,803,252
Totals	547	425	122	802,348	19,806,194

BULL BAYOU FIELD

October	25	25	..	23,430	641,235
November	12	11	1	6,635	595,910
December	24	23	1	10,830	618,750
January	27	25	2	5,370	667,900
February	22	22	..	5,200	535,848
March	21	20	1	10,010	549,072
April	44	40	4	25,815	621,375
May	45	40	5	19,320	691,270
June	29	25	4	1,960	588,750
July	45	40	5	6,075	518,250
August	37	27	10	2,935	500,464
September	35	29	6	3,035	449,250
Totals	366	327	39	120,615	6,978,074

CADDO FIELD

October	32	29	3	2,995	738,885
November	6	4	2	110	604,345
December	5	5	..	250	652,735
January	6	6	..	460	596,485
February	6	4	2	300	528,699
March	7	6	1	550	548,700
April	4	4	..	140	489,000
May	24	20	4	840	529,480
June	11	11	..	520	493,000
July	17	13	4	755	500,650
August	17	13	4	870	525,946
September	14	9	5	870	523,275
Totals	149	124	25	8,660	6,731,200

LOUISIANA WILDCATS

October	3	2	1	gas	
November	3	2	1	20	
December	5	4	1	gas	
January	7	2	5	gas	
February	1	1	..	gas	
March	9	5	4	18	
April	8	2	6	28	
May	20	9	11	30	50
June	19	10	9	1,092	5,000
July	14	9	5	815	
August	18	4	14	204	
September	14	7	7	165	
Totals	121	57	64	2,372	5,050

Pools of North Texas

Discovery Wells
Present Producers
Daily Average

DISCOVERY WELLS IN NORTH TEXAS

District	Company	Farm	Location	Date Comp.	Pay Sand	Total Depth	Init. Prod.	Pres. Prod.
Electra	Woodruff-Putnam	Putnam	H. & H. N. Blk. 2	April, 1911	1618-24	1630	260	5
South Electra	J. L. Culberson	Waggoner	B. S. & F. No. 13	3-15-14	932-23	1407	15	..
Bowers	Bowers Oil Co.	Foster-Allen	Stephens-Denison	7-19-20	1828-38	1850	80	30
Burkburnett:								
Old Field	Corsicana Oil Co.	Schmoker	E. Stanley Sur.	7-8-12	.....	1837	85	20
Townsite	Fowler Farm Oil Co.	Fowler	Out. Blk. 12	7-29-18	1735-39	1739	1600	25
N W Extension	Burk-Waggoner Oil Co.	Waggoner	Blk. 84 R. R. V. Lands	4-29-19	1674-1704	1704	2750	40
Shallow	C. C. Bradford	Cropper	Winters Sur. 322	6-10-16	626-42	543	5	2
Texhoma	Texhoma Oil & Ref. Co.	Daniel	H. Hastie Sur. 99	10-11-19	1282-1300	1300	225	30
Iowa Park	Forest Oil Co.	Ferguson	S. W. C. Blk. 30 L. Netherly Sur.	1-27-13	486-506	506	20	..
K-M-A	K-M-A Oil Co.	Munger	Sec. Blk. 30 Kemps W. V. F.	11-10-19	1762-71	1771	300	80
Holliday	Panther Oil Co.	Wilson	Sec. Blk. 25 Am. Tri. Col. Lands	12-2-16	1632-40	1640	35	16
Petrolia	(Data not available; first production secured in February, 1904.)							
Young County:								
Graham	The Texas Company	Graham	Allen Hines Sur. 5	Dec., 1919	3950-92	4000	40	30
South Bend	Roxana Petroleum Co.	Donnell	T. E. & L. Sur. 1111	11-24-19	1870-80	1880	50	40

DAILY AVERAGE PRODUCTION AND NUMBER PRODUCING WELLS IN NORTH TEXAS

	ELECTRA		BURKBURNETT									
			Old Field		Townsite		Northwest Extension		Shallow		Texhoma	
1919	Wells	Prod.	Wells	Prod.	Wells	Prod.	Wells	Prod.	Wells	Prod.	Wells	Prod.
August	1530	10,165	729	8,275	523	18,202	262	53,125	774	820		
September		10,000		8,025		18,100		63,650		865		
October		9,900		6,890		14,250		68,000		710		
November		9,600		7,200		14,750		62,525		835		
December		9,500		5,400		8,100		65,700		810		
1920												
January	1522	9,650	450	5,175	485	7,835	763	54,950	663	925	6	225
February		9,675		6,625		11,800		57,325		1,200		400
March		9,700		6,400		10,725		57,700		1,325		1,550
April		10,000		6,225		13,515		62,625		1,610		2,600
May		10,175		6,125		13,525		60,900		1,375		3,125
June		10,400		6,400		11,450		54,750		1,050		3,250
July		10,450		6,625		11,250		47,575		1,045		3,350
August	1457	10,300	756	6,900	455	11,800	1266	43,000	654	1,175	124	3,300

DAILY AVERAGE PRODUCTION AND NUMBER PRODUCING WELLS IN NORTH TEXAS—Continued

	Iowa Park		K-M-A		Holliday		Petrolia		Young Co.	
1919	Wells	Prod.	Wells	Prod.	Wells	Prod.	Wells	Prod.	Wells	Prod.
August	118	375			13	45	486	500		
September	118	375				75		540		
October		325				65		520		
November		350				30		375		
December		625				30		420		
1920										
January	183	750			13	75	480	420		
February		560		200		75		450		
March		535		100		225		435		
April		450		530		165		375		
May		375		1,350		175		355		
June		555		2,700		175		380		250
July		500		4,725		120		340		540
August	223	415	106	5,175	13	165	490	340	11	625

TOTAL PRODUCTION NORTH TEXAS FIELDS

To September, 1920

District	No. Wells	Total Prod. to Sept. 1, 1920	Proven Acreage	Av. Prod. per Acre	Av. Depth Sand	Av. Prod. Present per Ac. Sand ft.	Av. Prod. per Well
Electra	1,457	48,950,000	9,066	5,399	20	270	8
Burkburnett:							
Old Field	756	11,530,000	7,558	1,526	18	85	10
Shallow Field	654	1,975,000	700	2,818	18	166	3
Townsite	455	13,680,000	1,192	11,475	25	459	26
N. W. Extension	1,266	24,000,000	3,684	6,786	20	340	35
Texhoma	124	541,000	465	1,162	12	97	27
Iowa Park	223	517,000	1,579	328	10	33	2
K-M-A Field	106	452,000	788	574	6	95	49
Holliday	13	208,000	80	2,600	8	325	13
Petrolia	490	2,715,000	3,130	867	8	108	1
Total	5,544	55,618,000	28,242				

WELLS ABANDONED, PRODUCING AND DRILLING

September 1, 1920

District	Total Abn.	Total Prod.	Total Dr.
Electra	421	1,457	26
Burkburnett:			
Old Field	270	756	56
Townsite	155	455	..
N. W. Ext.	358	1,266	192
Shallow	107	654	16
Texhoma	50	124	33
Iowa Park	147	223	2
K-M-A	31	106	46
Holliday	13	13	23
Petrolia	85	490	28
Young	17	11	29
Total	1,654	5,555	451

Production in Oklahoma Is Well Scattered Among the Companies

TULSA, OKLA., Oct. 15.—The outstanding feature of Texas production, based on reports made to the State Comptroller for four quarters past, is that almost half of the oil—46 per cent—is produced by four companies. In Oklahoma it's different.

Twenty-two of the leading companies in Oklahoma—companies leading in production—are listed in the accompanying table, and the total for these companies is only a little more than half of the state's produtcion. The exact percentage for the first quarter of 1920 was a little less than 54; for the second quarter, the production of these 22 companies was a fraction more than 54 per cent of the state's total.

The production in Oklahoma for the first half of 1920 reached a total of 42,861,804 barrels, of which the 22 companies mentioned in the table produced 23,148,086 barrels. Companies making reports numbered between 1200 and 1500. During the first quarter the 22 companies accounted for 9,815,543 barrels of the 18,183,219 barrels produced in the state, and for the second quarter, out of a total of 24,678,585 barrels the leading companies produced 13,332,543 barrels.

Of the select four in Texas—The Texas Company, the Gulf Production Company, the Humble Oil & Refining Company and the Magnolia Petroleum Company—three appear in the six leading companies in Oklahoma. These are the Magnolia Petroleum Company, which is second in production in Oklahoma, the Gypsy Oil Company (Gulf), and The Texas Company.

The Prairie Oil & Gas Company of Independence, Kansas, leads the Oklahoma field, with a production for the first half of 1920 of 3,023,239 barrels. The Magnolia Company is almost a million barrels behind, while the Gypsy Oil Company is a comparatively close third.

During the first quarter, 1920, in Oklahoma the average daily production was 195,518 barrels. An immense increase was recorded when returns for the second quarter were filed by the various companies, daily production averaging 271,193 barrels. This includes all oil purchased on Indian lands, for which separate accountings are made.

Because many larger companies have producing subsidiaries in whose name production is reported, it is impossible to tell how much each produced without a knowledge of the interest they have in these subsidiaries. This should be borne in mind when considering the following table:

Rank	Company and Address	1st Qtr. 1920	2nd Qtr. 1920	Total
1	Prairie Oil & Gas Co., Independence, Kan.....	1,313,675	1,709,564	3,023,239
2	Magnolia Petroleum Co., Dallas, Texas.....	1,074,516	1,110,000	2,184,516
3	Gypsy Oil Co., Tulsa, Okla.....	565,849	1,411,388	1,977,237
4	Roxana Petroleum Co., St. Louis, Mo.....	702,334	1,003,233	1,705,567
5	*Tuloma Oil Co., Tulsa	1,074,516	574,573	1,649,089
6	The Texas Company, Tulsa.....	629,374	813,293	1,442,667
7	Carter Oil Co., Tulsa	536,300	891,556	1,427,856
8	Sinclair Oil & Gas Co., Tulsa	545,635	551,446	1,097,081
9	Marland Refining Co., Ponca City	332,333	683,812	1,016,145
10	Tidal Oil Co., Tulsa	370,390	608,665	979,055
11	Producers & Refiners Corp., Tulsa	454,834	398,738	853,572
12	Ohio Cities Gas Co., Tulsa	325,600	406,171	731,771
13	Oklahoma Prod. & Ref. Corp., Tulsa	244,389	469,422	713,811
14	Shaffer Oil & Gas Co., Chicago	185,785	472,564	658,349
15	Waite Phillips, Tulsa	45,008	558,924	603,932
16	Cosden Oil & Gas Co., Tulsa	333,596	218,302	551,898
17	Exchange Oil Co., Tulsa	208,058	276,657	484,715
18	John Markham, Tulsa	195,723	240,600	436,323
19	Skelly Oil Co., Tulsa	131,507	304,499	436,006
20	J. G. McCaskey, Ponca City	170,533	245,767	416,300
21	Hill Oil & Gas Co., Tulsa	145,531	236,432	381,963
22	Turman Oil Co., Okmulgee	230,057	146,937	376,994
	Total 22 companies	9,815,543	13,332,543	23,148,086
	Total all other companies	8,367,676	11,346,042	19,713,718
	Total all Oklahoma companies	18,183,219	24,678,585	42,861,804

*Includes Mid-Co Petroleum Co. et al.

Imports of Crude Oil From Mexico Show Steady Increase; Exports Off

IMPORTS of mineral crude oil have increased from 3,899,401 barrels in January, 1919, to 10,790,686 barrels for August of 1920 according to figures compiled from reports made by the Bureau of Foreign and Domestic Commerce. Exports of crude in the same period dropped from 339,021 barrels in January, 1919, to 177,224 barrels in May of the same year, and then reached the peak of 1,149,302 barrels last November. In August, 1920, exports of crude oil amounted to 532,938 barrels.

Crude from Mexico comprises the large part of total imports of this product. Several months during the twenty-month period covered there were imports from no other country. In August, 1920, however, when imports from Mexico passed the 10,000,000 barrel mark for the first time in history, imports from other countries totaled 66,000 barrels, also a record. With the exception of February, 1920, when Mexican crude imports dropped below the 5,000,000 barrel mark, a steady growth is shown during the twenty months period shown.

Exports of crude for the most part go to Canada. In only one figure in the accompanying table do exports to "other countries" exceed exports to Canada. In July, 1920, exports to "other countries" totaled 354,883 barrels, while exports to Canada totaled 346,757 barrels. Since the first of 1920 exports to Canada have declined considerably.

An idea of how imports from Mexico have increased may be gained by noticing that the imports for the first eight months of 1920 exceed by 4,000,000 barrels the total imports for 1919.

IMPORTS AND EXPORTS—In Barrels

	—IMPORTS FROM—			—EXPORTS TO—			
Month—	Mexico	Other Countries	Total Imports	Canada	Other Countries	Total Exports	Excess Imp. over Exp.
1919							
January	3,899,376	25	3,899,401	270,553	68,468	339,021	3,560,380
February	3,655,542	84	3,655,626	131,622	51,876	183,498	3,472,128
March	3,492,800	981	3,493,781	178,228	40,167	218,395	3,275,386
April	3,970,195	14,000	3,984,195	275,009	2,910	277,919	3,706,276
May	4,743,395	5,000	4,748,395	167,836	9,388	177,224	4,571,171
June	4,703,212	24,929	4,728,141	254,209	261	254,470	4,473,671
July	4,462,910	24,742	4,487,652	188,261	17,381	205,642	4,282,010
August	4,143,445		4,143,445	*	*	185,694	3,957,751
September	4,405,005		4,405,005	*	*	721,586	3,683,419
October	5,886,290	159	5,886,449	*	*	1,123,448	4,763,001
November	4,938,881	319	4,939,200	*	*	1,149,302	3,789,898
December	4,330,576	14,796	4,345,372	868,673	156,829	1,025,502	3,319,870
Total 1919...	52,631,627	85,035	52,716,662	6,414,421	347,280	6,761,701	45,954,961
1920							
January	6,293,353	626	6,293,979	421,618	7,068	428,686	5,865,293
February	4,939,913	51	4,939,964	730,464	66,576	797,040	4,142,924
March	6,502,835	279	6,503,114	849,498	11,988	861,486	5,641,628
April	6,185,637	747	6,186,384	456,359	193,057	649,416	5,536,968
May	6,964,479	1,092	6,965,571	470,590	185,117	655,707	6,309,864
June	8,118,991	1,183	8,120,174	427,141	143,831	570,972	7,549,202
July	6,768,210		6,768,210	346,757	354,883	701,640	6,066,570
August	10,724,686	66,000	10,790,686	418,674	114,264	532,938	10,257,748
Total 1920...	56,498,104	69,978	56,568,082	4,121,101	1,076,784	5,197,885	51,370,197

*Figures not available.

Texas-Louisiana Refineries in Lead

Plants Hold First Place in Gasoline, Kerosene and Fuel

TEXAS-LOUISIANA refineries lead all other sections of the United States in the manufacture of gasoline, kerosene, gas fuel oil, miscellaneous, and the amount of crude run, according to monthly reports issued by the Bureau of Mines. The July report published in the October 9th issue of The OIL WEEKLY contains figures from which the accompanying graphic representations were made.

Reports for May and June show the refineries of Texas-Louisiana ahead of all other groups in the refined articles specified. The report for April gives California a decided lead insofar as the gas and fuel oil output is concerned, Texas-Louisiana dropping into second place.

It is interesting to note that the Texas-Louisiana group of refineries handled 9,812,908 barrels of the 38,419,000 produced in all fields of the United States during the month of July. This represents almost 26 per cent of the nation's production handled by the plants of these two states. Of the crude run (all United States refineries) for the month, 37,024,052 barrels, the total run of the Texas-Louisiana refineries represents more than 26 per cent. In other words more than one-fourth of the crude which reaches refineries of the United States is handled by plants of these states.

Look Out for the Future!

When Louisiana's refining capacity is practically doubled, as it looks it will be from the number of refineries under process of construction, the story will be different. No other state is enjoying a more healthy refinery growth than Louisiana.

Six months ago Texas-Louisiana held first place among the different refinery groups in the number of barrels of crude oil run, and in the output of kerosene and miscellaneous. The growth during this period is easy to observe by glancing at the accompanying charts showing that Texas-Louisiana has gained the ascendancy since February in both gasoline and gas and fuel oil, at the same time holding first place for output of kerosene and miscellaneous products as well as crude run.

Six months ago the Oklahoma-Kansas group led Texas-Louisiana in gasoline output by about 100,000 gallons. The July report shows a difference in favor of Texas-Louisiana of practically 14,000,000 gallons.

To "we 'uns" in Texas and Louisiana, did you know that the refining plants of our section lead all other refinery groups in the output of gasoline, kerosene, gas and fuel oil, and miscellaneous products? And likewise that the amount of crude handled by refineries in these two states topped figures for all other groups? Neither did we until the recent report of the Bureau of Mines was issued and we were shown a thing or two.

More than one-fourth of the crude oil produced in the entire United States was handled by Texas-Louisiana refineries in July. And thus it has been for several months back.—Editor.

California Is Overtaken

California had first place in February as to output of gas and fuel oil. Its lead was 6,000,000 gallons. In July Texas-Louisiana had climbed from second into first place and was topping California by approximately 14,000,000 gallons. The change in relative positions did not come about because California's output decreased. On the contrary it increased from 156,373,010 gallons to 188,931,386 gallons. But Texas-Louisiana in the meantime had climbed from 150,788,588 gallons to 204,753, 933 gallons, an increase of a mere 33 per cent in six months.

A comparison of stocks on hand at all refineries for July, 1919, February, 1920 and July, 1920, is shown below.

Gasoline Shows Drop

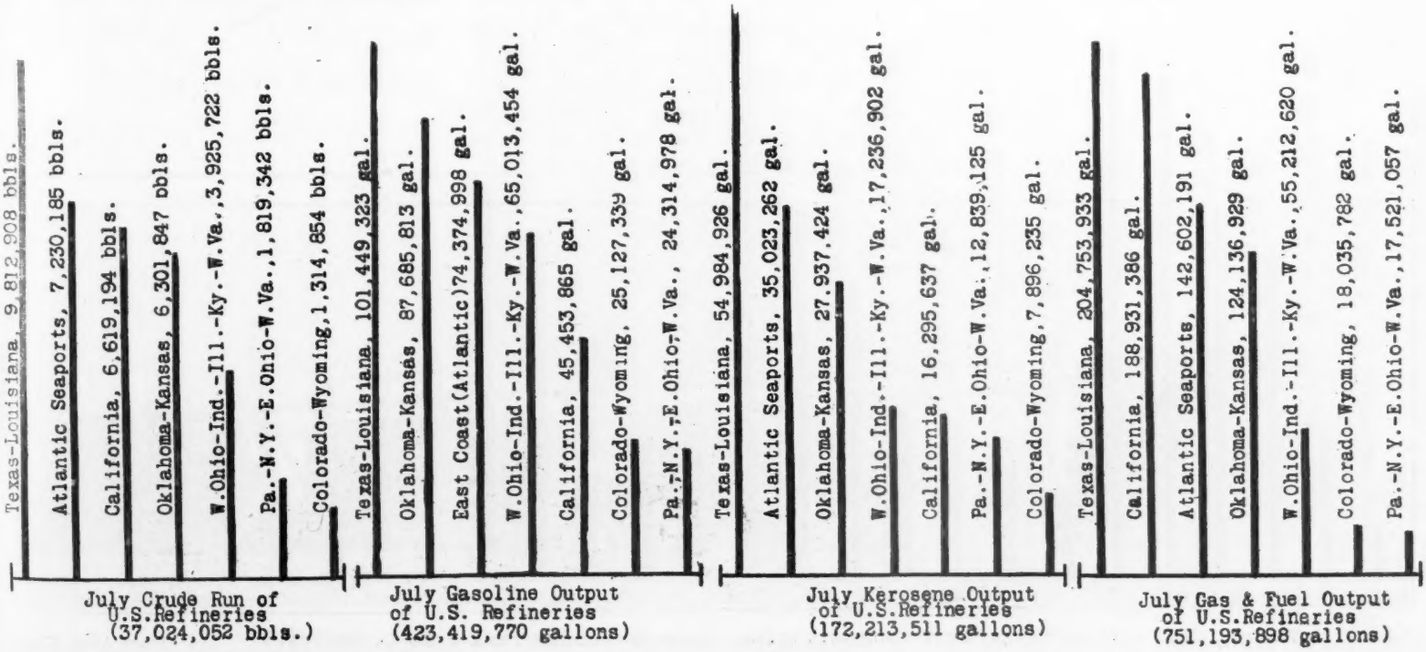
These three sets of figures, representing a single year's developments, show the "why" of the summer's gasoline advance and the eventual fall of kerosene. A difference of a million gallons of gasoline is shown between stocks on hand of July, 1919, and July, 1920. Kerosene on the other hand shows an increase of approximately 130,000,000 gallons.

The Bureau of Mines announced in connection with its July figures that on July 31, 1919, the stocks of gasoline at refineries amounted to 38 days' supply whereas a year later the stocks were reduced to 25 days' supply.

The amount of crude oil on hand July 31, 1920, exceeds the amount for either July 31, 1919, or February 29, 1920, by nearly two million barrels in the first instance and 3,500,000 in the second. In the matter of coke and asphalt there is little change in the amounts for February, 1920, and July, 1920, although there was considerable more of these products on hand July 31, 1919, than there was a year later.

The comparative figures of six months intervals are as follows:

	July, 1919	Feb. ,1920	July, 1920
Crude Oil (barrels)	15,304,915	13,500,599	17,086,253
Oils to be re-run (barrels)	1,034,976	863,220	900,544
Gasoline (gallons)	514,919,358	562,996,489	413,279,319
Kerosene (gallons)	279,855,061	330,120,942	410,853,047
Gas and Fuel (gallons)	817,809,519	590,322,125	655,152,293
Lube (gallons)	173,884,303	132,759,244	131,866,455
Wax (pounds)	255,207,227	197,996,501	171,666,198
Coke (tons)	40,194	21,709	21,058
Asphaltum (tons)	98,372	70,067	71,368
Miscellaneous (gallons)	479,127,372	405,588,469	505,098,890



The Strapping of Petroleum Storage Tanks

Directions Given for Preparation of Gauging Tables

By John R. Suman

Methods employed by several oil companies in strapping their tanks —wooden, steel, earthen and concrete—are listed and explained in this article by Mr. Suman.

Technical details are given, and the figures may be depended upon to be asolutely accurate. Refiners and producers will find this article of special value.—The Editor.

THE accuracy attempted and the detail gone into in the preparation of tank tables varies with the value of the product being handled. In the Mid-Continent fields, where the market price of crude oil reaches as high as $4.50 per barrel, much more detail is required than in the Gulf Coast region or in the Mexican fields, where fuel oil prices get as low as 75 cents per barrel. In making up tables for tanks in which refined products are stored, even more accuracy is needed. In preparing tank tables where too much accuracy is not required, the following formula is used quite extensively: Capacity of any round tank in barrels per inch of depth equals $C^2 \times .00118115$, where C equals the inside circumference of the tank in feet.

The inside circumference is found by making a deduction for the thickness of stave or steel plate from the measured outside circumference. These deductions will be as follows:

Deductions Wood Staves

Thickness —inches	Deduction
1—0	0.52
—1/16	0.56
—1/8	0.59
—3/16	0.62
—1/4	0.65
—5/16	0.69
—3/8	0.72
—7/16	0.75
—1/2	0.78
—9/16	0.82
—5/8	0.85
—11/16	0.88
—3/4	0.91
—13/16	0.95
—7/8	0.98
—15/16	1.01
2—0	1.04
—1/16	1.08
—1/8	1.11
—3/16	1.15
—1/4	1.18
—5/16	1.21
—3/8	1.24
—7/16	1.27
—1/2	1.31
—9/16	1.34
—3/8	1.37

Deductions Steel Tanks

Gauge	Thickness inches	Deduction
11	1/8	.0653
10	9/64	
9	5/32	.0817
8	11/64	
7	3/16	.0983
6	13/64	
5	7/32	.1147
4	15/64	
3	1/4	.1310
2	17/64	
1	9/32	.1473
0	5/16	.1637
00	11/32	.1800
3–0	3/8	.1963
4–0	13/32	.2127
5–0	7/16	.2290
6–0	15/32	.2454
7–0	1/2	.2617

As a general rule the following formulae will be found useful in preparing tank tables and in checking computations:

Capacity of cylindrical tanks in barrels of 42 gallons:

Per inch of depth =
(Inside circumfer. in ft.)² x .00118115

Per ¼ inch of depth =
(Inside circumfer. in ft.)² x .00029529

Per foot of depth =
(Inside circumfer. in ft.)² x .01416

Total capacity =

$$\frac{\text{(Inside diam. in ft.)}^2 \times \text{(Depth in ft.)}}{7.15307}$$

= (Diameter)² x Depth x 0.1398

Capacity of rectangular tanks in barrels of 42 gallons:

Per ¼ inch of depth =
Inside area base in sq. ft. x .003734

Wooden tanks are shaped like frustrums of cones, and circumference measurements are usually taken with a steel tape. The first measurement is taken six inches above the bottom of the tank, and other measurements are taken every two feet of height thereafter. Intermediate circumstances are gotten by interpolating. The position of the bottom of the tank is ascertained by measuring up underneath the tank until the bottom is encountered and adding two inches for its thickness. Should hoops interfere with regular two foot measurements, the measurements can be taken at convenient points and interpolations made for the regular two foot measurements. The depth of the tank is then measured and the space occupied by the vertical roof supports is calculated. The following is an example of a set of notes taken in the field in the strapping of a 1600 barrel wooden tank, No. 202, Temple Oil Company, Crow lease, Jennings,, La., field:

Height above Bottom	Circumference in feet	Difference in Circumference
0′–6″	88.08	
2′–6″	86.95	1.13
4′–6″	85.94	1.01
6′–6″	84.83	1.11
8′–6″	83.59	1.24
10′–6″	82.36	1.23
12′–6″	80.88	1.48
14′–6″	79.53	1.35
	672.16	

Thickness of stave: 2″
Height: 15′–6″

Deadwood:
23 pieces 2 x 6 uprights
80 ft. 1 x 6 braces at 8 ft. to 9 ft from bottom of tank.

Manner of Computing Volume

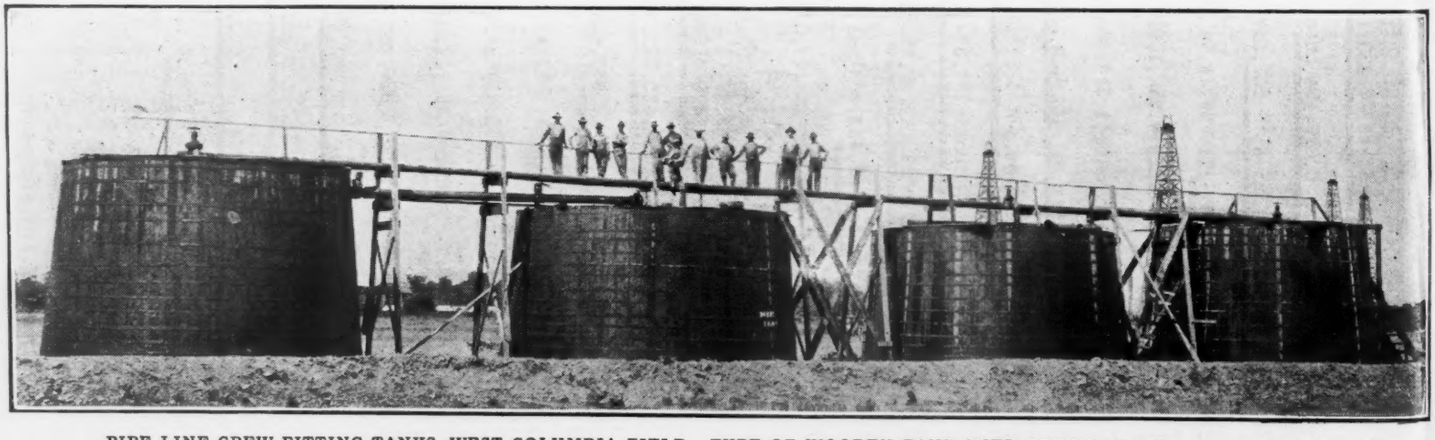
The volume of the tank is computed in barrels per inch in the different zones, the volume calculations usually being made every 3 inches. The calculations are made as for frustrums of cones. The volumes are computed for depths of ¼ inch. The following is an example of the computation for the volume for a ¼ inch frustrum in the zone between 6 ft. 6 in. and 7 ft. 6 in.:

Circumference at 6 ft. 6 in.	84.83
Circumference at 7 ft. 6 in.	84.21
Mean circumference	84.52
Deduction for 2″ stave	1.04
Inside mean circumference	83.48

$$\text{Barrels per } ¼'' = \frac{(83.48)^2 \times .0011811}{4} = 2.0548$$

$$\text{Deadwood deduct'ns} = \frac{23 \times 2 \times 6}{4 \times 231 \times 42} = .007$$

Net barrels per ¼ inch 2.0477



PIPE LINE CREW FITTING TANKS, WEST COLUMBIA FIELD. TYPE OF WOODEN TANK USED EXTENSIVELY. Photo Allen, Houston.

The regular deduction per cent for loss in storage will be deducted from 2.0477. The contents in barrels per ¼ inch are calculated for the regular intervals, the intervening capacities per ¼ inch obtained by interpolating and the whole added up on an adding machine. After making each addition, a sub-total is struck off on the machine and this sub-total gives the total contents of the tank in barrels to that point. It is the sub-totals which are used in making up the actual tank table which is used in gaging. The tank table gives the number of barrels in the tank at any depth. A total of 744 sub-totals would be needed in making a table with readings every ¼ inch where a tank is 15 feet 6 inches deep.

Steel Tanks

In strapping 55,000 barrel steel storage tanks containing crude oil of fuel oil grade, it is customary to take but one circumference measurement at the top of the first course of steel plates. Different companies have different rules in regard to this, however. Some companies take two circumference measurements, one being around the middle of the second ring and one around the middle of the top ring. Still other companies take measurements around the top of every ring, possibly interpolating for the measurements on the fourth and fifth rings. This procedure is rather unnecessary, however, as in measurements taken so far above the ground inaccuracies are apt to creep in which will more than offset any difference which might exist in actual circumference. The circumference of the top course is taken by reaching down over the eaves of the tank, the tapeman lying flat on the roof. The height of the tank is considered to be the distance between the base of the bottom angle iron of the tank and the top of the top angle iron.

Position of Timbers

The deadwood in the tank must be measured carefully and the vertical position of each timber given. In giving timbers such as mud sills, the flat side is usually given first; i. e., if sills are 2" x 12" and 6 ft. long, with the 12" side lying flat they should be given as 12" x 2" x 6'. Total volume of diagonals is figured and divided proportionally for the vertical distance through which they extend.

The tank table prepared must give the total number of barrels for each inch of depth, and at one side a small table of capacities for sixteenths of an inch. This latter table is gotten by taking the reading that is used most in making up the table and dividing it into barrels per sixteenth of an inch.

Example of Tank Strapping

Field notes Yupon Petroleum Company, tank No. 876, 55,000 barrels, Hare Tank Farm, Pine Island district. Strapped 4-26-17, by T. R. B. for Yupon Petroleum Company, and J. C. Case for Pelican Pipe Line Company.

Total outside circumference, 360.23 ft; height, 30.29 ft. (30 ft. 3½ in.); plate thickness 7/16.

Deadwood:

0'–0"	to	0'–3"	308' 10" x 3" Sills
0'–3"	to	0'–9"	119' 8" x 6" Blocks
0'–9"	to	19'–0"	40—6 x 8 Posts
			31—6 x 6 Posts
19'–0"	to	20'–0"	40—6 x 8 Posts
			31—6 x 6 Posts
			1155 ft.—2 x 6 Braces
20'–0"	to	29'–8"	40—6 x 8 Posts
			31—6 x 6 Posts
			480—1 x 6 Diagonals
29'–8"	to	29'–10"	20—6 x 8 Posts
			31—6 x 6 Posts
			20—8 x 2 x 1 Caps
29'–10"	to	30'–3"	20—6 x 8 Posts
			31—6 x 6 Posts
			340'—6 x 6 Caps

Office Work

360.23 Outside Circumference
0.23 — Deduction for Plate

360.00
360

21600
1080

$129600 = C^2$

$C^2 \times .0011811 = 129600 \times .011811$
$= 153.07056$ = Gross bbls. per inch depth

Deducting 2% = 153.07 — 3.06
= 150.01

Deadwood Calculations

0'–0" to 0'–3":

$$\frac{308 \times 12 \times 10 \times 1}{42 \times 231} = \frac{6160}{1617} = 3.809$$ bbls. per inch taken up by deadwood.

150.01—3.809=146.20 net bbls. per inch at this depth.

0'–3" to 0'–9":

$$\frac{119 \times 12 \times 8}{42 \times 231} = \frac{1904}{1617} = 1.177$$

150.01—1.177=148.83 net bbls. per inch depth

0'–9" to 19'–0":

$$\frac{(40 \times 6 \times 8) + (31 \times 6 \times 6)}{42 \times 231} = .31$$

150.01—.31=149.70 net bbls. per inch depth.

19'–0" to 20'–0":

$$\frac{40 \times 6 \times 8}{42 \times 231} + \frac{31 \times 6 \times 6}{42 \times 231} + \frac{1155 \times 12 \times 2 \times 6}{12 \times 42 \times 231} = 1.74$$

150.01—1.74=148.27 net barrels per inch.

20'–0" to 29'–8":

$$\frac{40 \times 6 \times 8}{42 \times 231} + \frac{31 \times 6 \times 6}{42 \times 231} + \frac{480 \times 12 \times 1 \times 6}{116 \times 42 \times 231} = 0.34$$

150.01—0.34=149.67 net bbls. per inch.

29'–8" to 29'–10":

$$\frac{(20 \times 6 \times 8) + (31 \times 6 \times 6) + (20 \times 12 \times 8)}{42 \times 231} = 0.41$$

150.01—0.41=140.60 net bbls. per inch.

29'–10" to top:

$$\frac{(20 \times 6 \times 8) + (31 \times 6 \times 6) + (34 \times 12 \times 6)}{42 \times 231} = 2.74.$$

150.01—2.74=147.27.

The figure 149.70 is divided into sixteenths and used in making up the table for sixteenths.

Adding Machine Used

In making up the tank table the adding machine is used the same as for tank tables for cypress tanks, sub-totals being drawn after each addition. In this particular case 146.20 would be added three times, then 148.83 would be added to this six times and 149.70 would be added to this 219 times and so on until each increment was added the proper number of times for the depth through which it occurs. The grand total is the net capacity of the tank.

In preparing tank tables for tanks in which heavy Mexican Crude (12° Be') is stored "outage" tables are generally used. These tables give the capacity of the tank according to the measurement to the top of the fluid from a fixed point on top of the tank. This is done because of the difficulty of getting the plumb bob on a steel gaging tape through the heavy fluid and the trouble of locating "bottom" accurately. A long brass bar, carefully marked to eighths of an inch is lowered on the end of the gaging tape a couple of inches into the fluid and a careful reading taken on the "knife blade" on top of the tank. The gaging tape is then pulled out and the reading on the brass bar deducted. The net reading is the correct "outage" in the tank and the tank table shows the amount of oil in the tank for this outage.

Earthen and Concrete Tanks*

Reservoir Measurements and Tables: For the convenience of the gager a small hatch is

PRODUCTION REACHED SUCH HEIGHTS AT WEST COLUMBIA THAT COMPANIES RESORTED TO EARTHEN TANKS FOR STORAGE. Photo Allen, Houston.

Photo Allen, Houston

TANKS SUCH AS THESE—THE 55,000 BARREL TYPE—ARE STRAPPED AS DETAILED BY MR. SUMAN. PICTURE SHOWS GULF REFINING COMPANY'S TANK FARM AT GALVESTON

placed in the roof of the tank, usually near the head of the stairway. The gage tape is suspended through the hatch into the open tank. However, as regards reservoirs, it is customary to set what is known as a gage plate at some convenient place as close as practicable to the lowest point in the bottom of the reservoir and to take all measurements for depth of oil from this plate. It comprises a steel plate about one-half inch in thickness and 3 feet square, which is set with foundation bolts and carefully leveled and grouted. This work is done as the part of the floor in that vicinity is being constructed so that it becomes an integral part of the lining. Some companies use a smaller gage plate and place on it a vertical pipe 4 to 10 inches in diameter of sufficient length to extend out through the roof of the reservoir. The walls of the pipe are perforated or slotted, and the top is fitted with a cap. Measurements for depth of oil are then taken through the pipe.

Testing Gage Plates: One of the first duties of the field or construction engineer in the procuring of data necessary for the preparation of a gage table for the reservoir is to examine carefully the gage plate and determine whether all the foundation bolts are tight, and whether the plate has been properly grouted and has not sprung at any point, but is absolutely level over its entire surface. The following information should then be procured:

Necessary Measurements

1. The diameter at the toe of the inner slope[1].
2. The diameter at the top of the inner slope[1].
3. The elevation of the gage plate.
4. The elevation of a sufficient number of points on the bottom so that an accurte contour map may be plotted, the contour interval of which should not be more than one-fourth of an inch.
5. The dimensions of all footings, posts, braces, and other deadwood as outlined for tank strappings[2].
6. The location and the size of the sump containing the swing pipes and the water draw-off pipes.

Computing Gage Table: From the elevation of the points on the bottom of the reservoir a contour map of one-fourth inch material interval is plotted and from this the gross content up to the gage plate is computed. To this is added the volume of the sump and from the sum is subtracted the volume of the deadwood up to the plane of the gage plate. The net amount thus obtained gives the content of the reservoir up to 0 feet 0 inches on the gage table.

If the gage table is to read to one-eighth of an inch, as is usually the case, the content is computed in a similar manner proceeding by eighths of an inch, up to the point where a horizontal plane will cut the side slopes of the reservoir. From this point to the top the volume is computed at one-eighth inch intervals, the reservoir being considered as a frustrum of a cone, deadwood being deducted as in the tank-table computations.

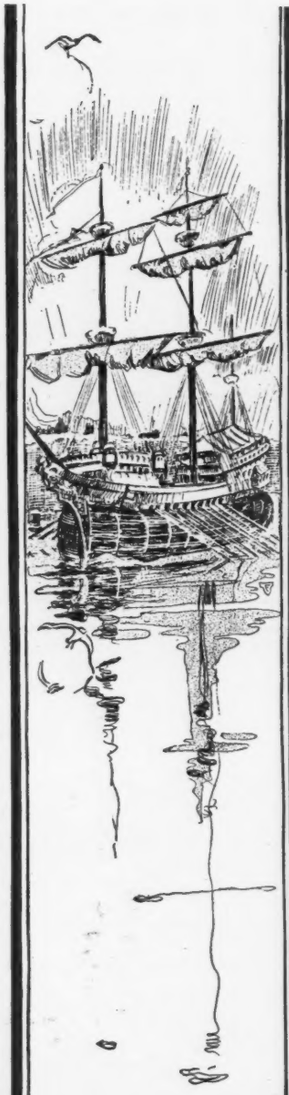
Gage tables are made to read to the nearest one-hundredth of a barrel. Volumes for fraction of an inch less than one-eighth are obtained by interpolation.

[1]Bulletin No. 155, Bureau of Mines.

[1]This measurement should be taken in as many places as possible and carefully checked.

[2]As regards a reservoir, however, on account of the slope of the bottom, the exact location of the deadwood must also be determined.

Since Italy began producing oil in 1860, there have been six years when her production was less than 100 barrels a year. In 1860 it was 36 barrels, and for the four succeeding years as follows: 29, 29, 58, 72 barrels. It stayed well above the 100 barrel mark until 1870, when it dropped to 86 barrels.



The Power of Tradition

IT was a tradition in the old Venetian republic for the duke to sail out every year in his barge to drop a gold ring in the sea, in token that Venice and the sea were wedded. All the dignitaries of Venice in their brilliant robes stood on the deck of the royal barge.

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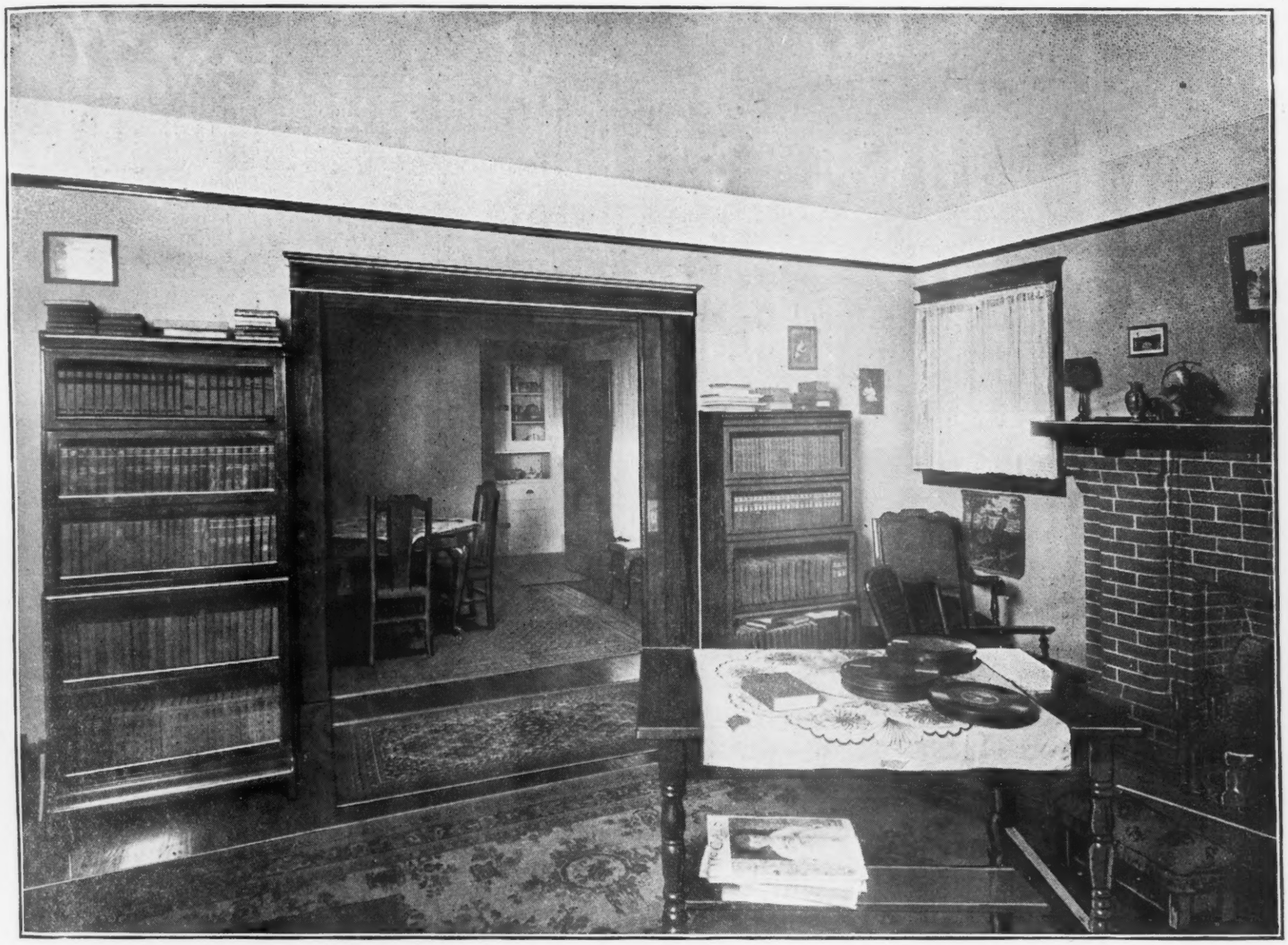


ELECTRIC FAN, GRAPHOPHONE RECORDS, SNAPPY STORIES—WHAT ELSE COULD THE EMPLOYE CALL FOR? AN HUMBLETOWN LIVING ROOM.

The Oil Worker Cared For

"Humbletown" the Ideal "Camp"

By R. L. Dudley

IN the effort to increase production, efficiency and to promote a better feeling of company loyalty, oil companies all over the United States, and abroad, are giving the housing problem close attention.

This attitude on the part of the company is being met with almost universal appreciation on the part of the employee, but the unions have been looking on the building of houses with more or less disfavor, since it loosens their hold on the employee. However, the employee with a fair mind appreciates that there is no sinister purpose behind a company's taking care of its employees in order to bind those employed more loyally to the company and the general effect will be to create a greater feeling of co-operation on the part of the employee.

In many oil fields the necessity to build camps for the workers was paramount. Good health demanded it, and certainly a small labor turnover demanded it. In one Gulf Coast field where considerable activity is under way the companies have found it hard to hold men with families because there were no houses already constructed to care for their men and this field, until very lately, has been known as a bachelor field. Unmarried drillers are all right, of course, but the feeling that a man with a family can be depended to "stick" better than the man without a family is founded on logic.

In West Texas camps were an absolute necessity, as the country was sparsely settled, lumber yards were few and lumber high in price, making it simply prohibitive for the oilfield worker to construct for himself a home that he would be willing to take his family into.

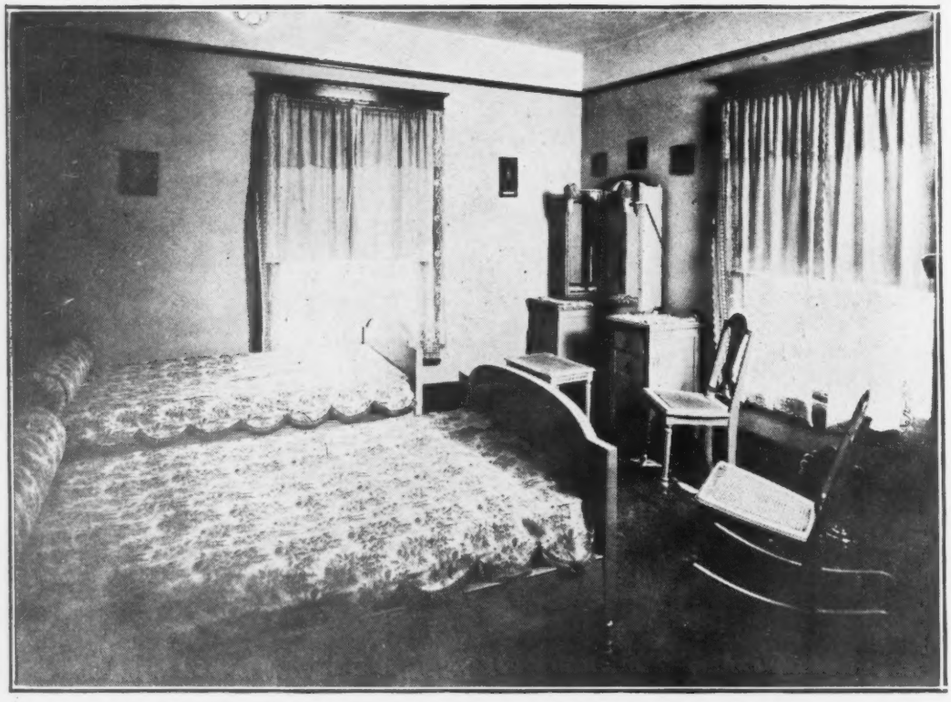
All Kinds of Camps

This has lead to the construction of camps by all the companies of any size. Some of these camps are simply rough houses where the dwellers were protected against the elements. Others are marvels of comfort and convenience.

Standing out, probably, as the best equipped oilfield "camp" in the Southwest, and possibly in the world, is the camp of the Humble Oil & Refining Company at Cisco. This "camp" is known as "Humbletown" and occupies considerable space. It had, about the middle of the summer, when the accompanying photographs were taken, 65 dwelling houses, a number of bunk houses, a recreation hall, concrete tennis courts, a commissary that would make a city housewife envious, its own gas lines from a company gas well 7 miles distant, its water works, fire protection, and its electric light and ice plant.

The degree of comfort attained in "Humbletown" makes it especially interesting. The residences, built at a cost of more than $6,000 each (with the material bought in lump lots) have hardwood floors in the front of the house, tiled bath rooms, plaster walls and ceilings, built-in fixtures in the kitchen and even laundry trays on a screened-in back porch.

The houses are, as a whole, of a class far in advance of the average home in Cisco—and Cisco is not a boom town but a little western



MIGHTY FINE! LAMP THE UPTOWN CHAIRS AND TWIN BEDS!

be attested to by the writer who was a visitor at "Humbletown" on July 3 and 4. He came in unexpectedly as a guest of Vice-President Hanrahan of the Humble Pipe Line Company, and was served the best meal that he has yet eaten in West Texas.

The company makes a charge of $1 a day for staying in the bunk houses. This includes three meals and lodging.

The idea of "Humbletown" was born in the brain of W. S. Smullen, formerly vice-president of the company but now vice president and general manager of the Tropical Oil Company, and the plan was caried out by Superintendent S. P. Farish.

Same Problem Elsewhere

The housing situation in Mexico and in South America where drilling operations are under way, is also receiving much attention right now. As far back as two years ago an entire shipload of ready-cut houses was shipped to Mexico by a Houston housebuilding company, and "homebuilding" is one of the major problems that many Mexican and South American companies are now facing.

This problem of housing has received the attention of many industrial concerns and now ready-built houses, knocked down and ready to be set up, can be bought outright. Other housing concerns make a specialty of taking over the housing problem of a company and solving it by cutting all the lumber in the factory and shipping the houses with building crews to the building site.

Not only wooden houses, but slate houses and poured concrete houses are to be found

city with 6000 or more inhabitants even before oil was struck in West Texas.

The houses are all built on concrete foundations, to which they are bolted. They are all painted in company colors, battleship grey and dark red, and this uniform coloring is perhaps the only objectionable feature to the entire city. However, the colors were decided upon because they were the company's colors.

Houses Same But Different

Each house has a nice lawn, the streets are carefully graded, and graveled, and while the houses are generally of about the same size, they differ materially in outside form, making "Humbletown" look like a real city instead of a "camp".

The company charges for these residences the sum of $5 per room per month, with water, gas and electricity furnished. In other words, a bungalow of a living room, two bed rooms, dining room, kitchen, and bath, costs only $30 per month. There are several residences with only one bed room, making the total cost $25 per month.

Some Recreation Hall!

The recreation hall—a spacious building with hardwood floor for dancing, an electrical piano, a rustic fireplace, dressing and rest rooms for both men and women—is a feature of the "city". Special efforts are made to see that the recreation hall is used, and it is our understanding that it is used with distinct success.

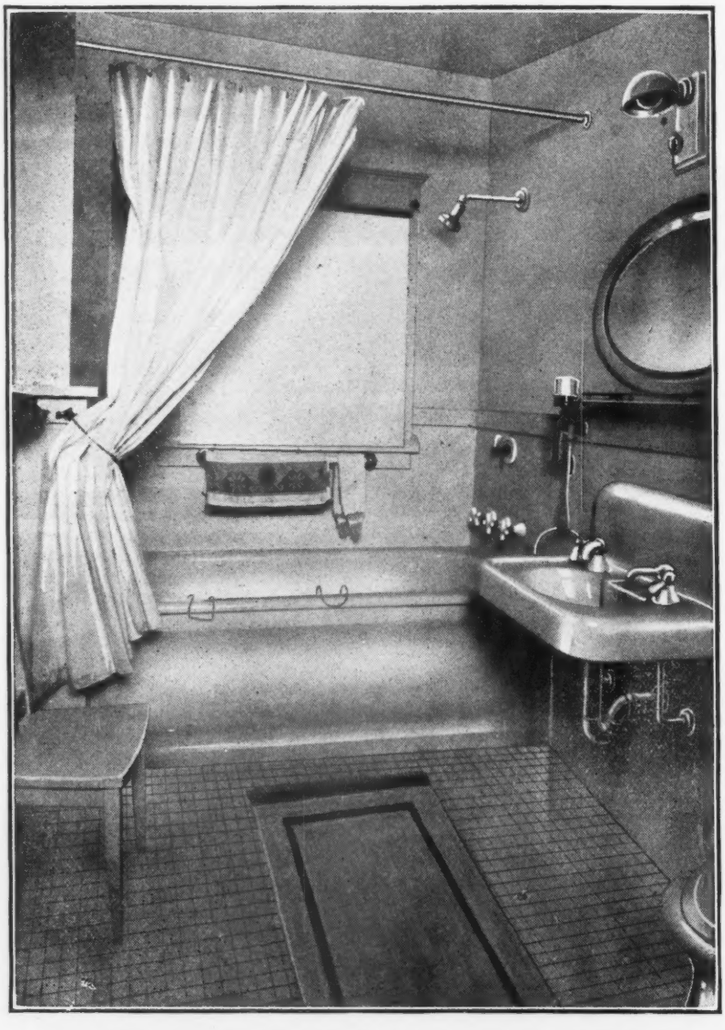
The bunk houses, intended for men without families, also are very comfortable. Each room has running water in it and is so constructed that it has a breeze draught through it. There are five of these bunk houses capable of housing 160 men.

The mess hall is deserving of a better name. It is really one of the most attractive places in "Humbletown". On the inside everything is painted with white enamel. The tables are of white porcelain and the entire interior is spotless.

The kitchen has all the modern conveniences, electrical dishwasher, big gas oven, where the town's bread and cakes are cooked, and even its individual waterwell.

And in the Kitchen!

Over the kitchen presides Mrs. Hattie Good who has the job of keeping several hundred appetites satisfied. That she does it well can

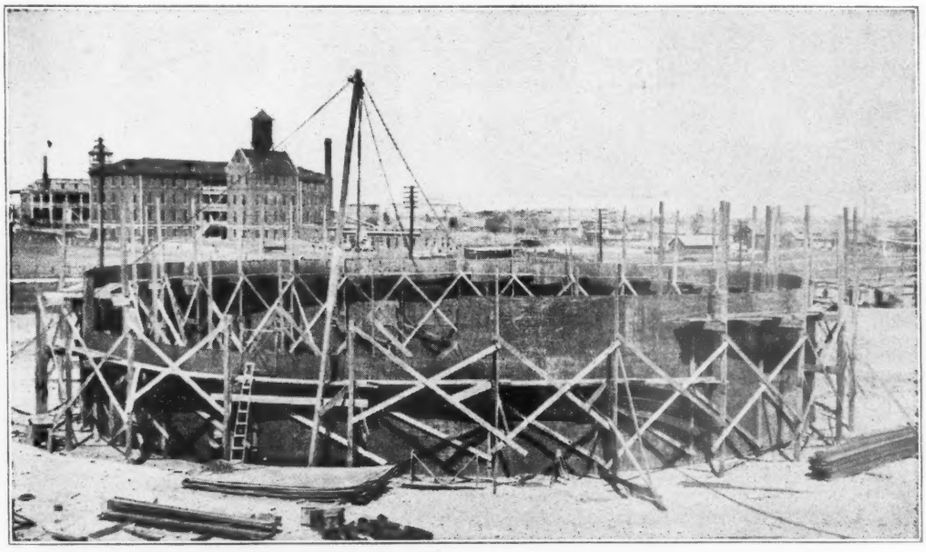


BATH ROOM IN OIL WORKER'S HOME, HUMBLETOWN

OIL STORAGE TANKS

REFINERY EQUIPMENT

Stills
Agitators
Condenser Boxes
Coolers



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THIS remarkable tool joint, after 2 years of actual trial by the oil industry, is today probably the most widely used of all tool joints. Everywhere you'll find drillers using and *respecting* the HUGHES TOOL JOINT.

No other joint is made so nearly indestructible. Seasoned drillers who know tools and steels from A to Z, are actually *puzzled* at this tool joint's ability to withstand the roughest usage. Users appear to be unanimously agreed that HUGHES TOOL JOINTS are "injury-proof" and that they "last forever."

One of this joint's important advantages is *Speed.* It screws tight in less than 4 turns and stands the roughest, fastest handling, making possible remarkable time records both going into the well and coming out.

Made by the HUGHES TOOL CO., Houston, Texas, under the Guiberson-Whittier basic patent and our own exclusive thread patents. Sold everywhere.

TOOL

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ES

JOINTS

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as the homes of oil refinery and oilfield employees. Accompanying will be found a number of photographs of oilfield housing, both at home and abroad.

The photograph below shows an oil field camp at Bull Bayou, Louisiana.

Many fields in the Gulf coastal section have been favored by the several companies operating in the matter of housing conditions. A number of houses have been provided for workers at West Columbia, Goose Creek, Humble and other localities.

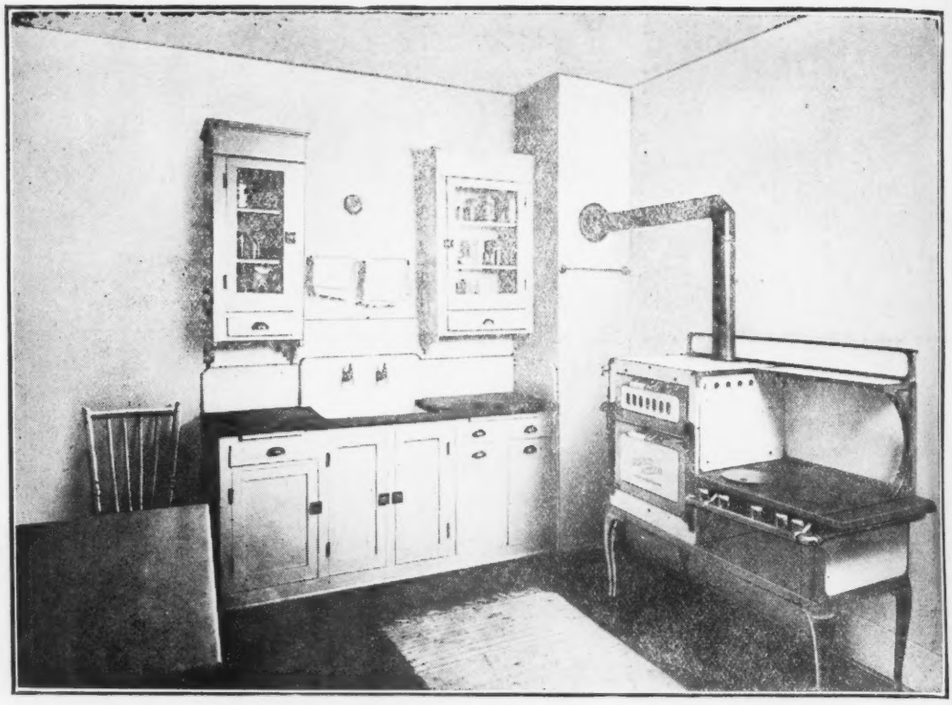
High Costs Are Bucked

During the year several of the larger companies found it necessary to provide houses for their workmen in towns well beyond the pioneer stage. It was merely a matter of constructing residences when no one else seemed willing to buck the high cost of labor and materials. In this way many families were cared for which would, without such accomodations, have been forced to live as humans should not be forced to live.

As a rule when a company goes in for social betterment it does not restrict its activities to residence-building alone. Social centers such as school houses and halls for gatherings are constructed and an effort is made at all times to promote a spirit of contentment and satisfaction in the different fields.

The pinch of gratitude required in the make-up of an ideal person is sometimes conspicuous by its absence. This does not apply exclusively to the oil worker who fails to appreciate what his company has done and is doing for him toward remedying the problem of proper living conditions. However cases may be cited where it does apply to oil field workers. But in the long run the companies who "put themselves out" for their men reap an abundant harvest. They are usually after more and better work from their men. And they usually get it.

In 1918 the United States produced 65 per cent of the world's petroleum, 60 per cent of the world's copper and 50 per cent of the world's silver.



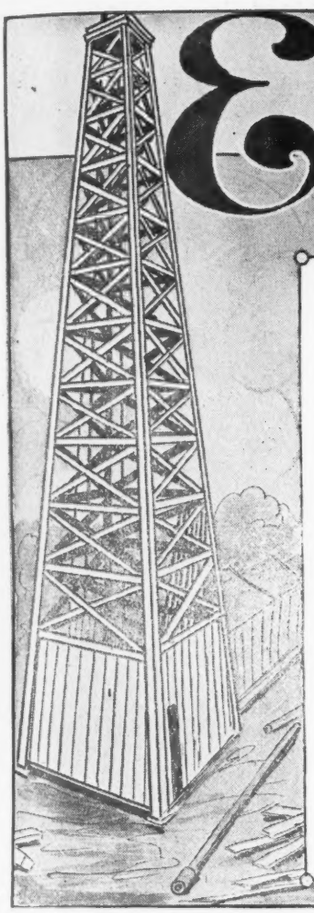
BOY, BOY!—AN HUMBLETOWN KITCHEN FIT FOR A BRIDE!

GOOD PAY STRUCK IN FRANCE NEAR A WELL 180 YEARS OLD

Washington, D. C., Oct. 15.—Among the oldest oil wells in the world are those in Alsace. The Pechelbronn wells were first discovered in 1735; a few years later a small refining plant was established and the wells have been worked for 180 years. In 1888 underground digging was replaced by drilling but during the recent war the old methods were resorted to and shafts driven to a depth of 825 feet. A network of electric wires, more than 26 miles in length furnishes power to about 500 pumps. Three shafts with 13,000 feet of subterranean galleries, produce more than 25,000 tons of crude petroleum a year.

Only recently a well was drilled to a depth of 1427 feet in a region heretofore undeveloped and pay was hit. The well in May was flowing about 350 barrels of oil a day. New refineries may be installed soon.

The Saboontchy-Romany oil fields of Russia have wells which yielded from 75,000 to 120,000 barrels of oil daily for weeks.



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NATIONAL PIPE

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CUPS
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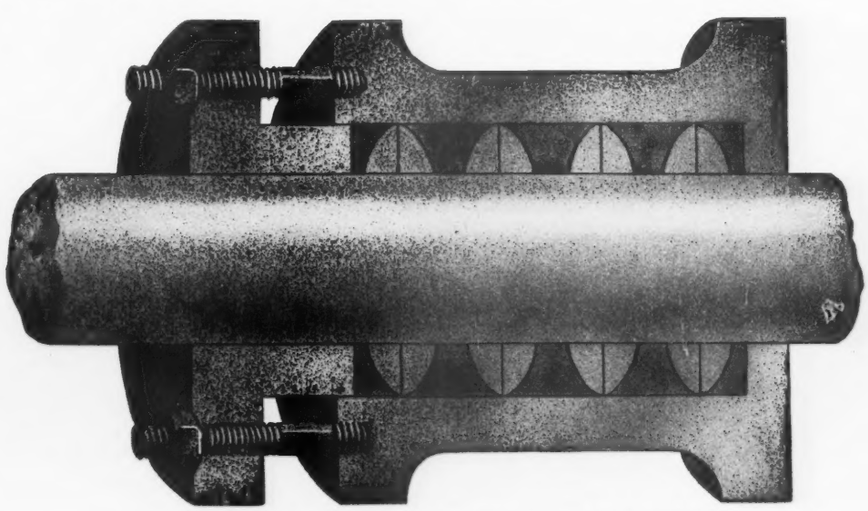
PEDEN IRON & STEEL CO.

HOUSTON SAN ANTONIO FT. WORTH SHREVEPORT

RHODES METALLIC PACKING CO., Inc.

SHREVEPORT, LA. SEATTLE, WASH.

A Simple, Durable, Economical Rod Packing



Position of Rhodes Metallic Rod Packing Installed in a Stuffing Box Having a Square Back and a Square-Faced Gland

Say you saw it in THE OIL WEEKLY

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REGULAR PATTERN CASING SHOES
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M. & F. STEEL NIPPLE

ANNOUNCING *re-organization of the*

Wells Tank Car Despatch Line, Inc.

Capital Paid In $400,000

DALLAS, TEXAS

We buy and sell crude and fuel oil and refined petroleum products.
We buy and sell new and used tank cars and storage tanks.
We furnish tank cars for the transportation of liquids and act as traffic managers in the movement of cars.

WRITE US for quotations on FUEL OIL, crude oil, gas oil, gasoline and kerosene

REFINING SECTION

HATS off to the refiner!

From Big Muddy in Wyoming to Somerset in Texas; from the Allegany district in New York to Fresno County, California the men on the refining end have kept pace with the producer and the marketer, other members of the great triumvirate of Oildom.

Hats off to the refiner! He has done and is doing his share. Once it was different but now he calls for crude, begs for crude, entreats for crude, and finally pays a bonus to get it. The refiner is up with the fox and judging from a review which shows us that many plants are not being operated, we are persuaded that he's outjumped the fox and passed him.

Four hundred and eighty-eight refineries with an operating capacity of 1,932,340 barrels daily, with 154,600 barrels daily capacity being added to existing plants and 140,550 barrels daily capacity being built in the form of new refineries is the status of the refining situation in the United States. These statistics are compiled by The OIL WEEKLY and while they include some figures obtained from the report of the Bureau of Mines, they will be found much more complete and up-to-the-minute.

Gain Is Notable

Four hundred and eighty-eight refineries with a potential (including units and plants under construction) daily capacity of 2,227,490 barrels! In January when the Bureau made its report, the total number of refineries was 461, which included those under course of construction, and the combined capacities totaled 1,843,480 barrels. This represents a gain of 28 plants and a daily capacity of 384,010 barrels. And this in less than a year.

Like figures? See what the 488 refineries with a combined daily capacity of 2,227,490 barrels would do in a 360-day period. It's somewhat like figuring on how many chickens you'll have next June if you start a ranch on December 1, with fourteen speckled Plymouth Rock hens, and a Rhode Island Red rooster. But it's figures. Their run, giving each credit for every day full capacity would run past the 800,000,000 mark. And as the United States at its best will produce a little more than a half billion barrels this year, we see how much crude would have to be imported to keep all the stills going.

But, and here's where the rub comes in, not a few refineries have closed down for one reason or another. Money was "tight", transportation has been tied up, crude couldn't be had. And refineries, especially the smaller plants, have suffered. In the Southwest the situation has been anything but cheerful during the past three or four months.

The three states of Texas, Oklahoma and Louisiana boast of 53 per cent of the total number of refineries in the United States. Their combined daily capacity is approximately 48 per cent of the total daily capacity of all refineries in the 26 states contained on the list. The Southwest is well represented.

The Situation In Texas

Compared with the total refinery capacity of 412,500 barrels reported in the early spring of 1920, the State of Texas has made considerable progress, its operating capacity at this time being 447,550 barrels or an increase of 35,050 barrels. In addition increases are being made at Texas plants which will supplement the daily capacity by 74,100 barrels and additional plants are being built which have a total capacity of 20,000 barrels. Within a short time Texas should be able to report a total daily capacity of well over a half-million barrels—541,650, to be exact. Less than a year ago when The OIL WEEKLY compiled figures the total operating capacity was 412,500 daily with an aditional 107,000 barrels daily promised by refineries which were under the course of construction, or a total of 519,500 barrels daily capacity.

Many of the refineries listed as being built last spring got no further than the paper upon which plans had been drawn. Others weathered the late spring and summer and are now full-fledged plants turning out the different refined products. Several did not progress even to the blue-print stage, being born in the mind of some promoter and dying within the same confines when "things began to get tight."

Reports from North Texas in the early fall indicated that the production in that section was not of sufficient volume to keep the battery of refineries—large and small—running to capacity. In fact many of the smaller plants had been closed temporarily. Dallas, Fort Worth, and Wichita Falls with a possible daily refining capacity of 133,000 barrels of oil have been depending to a great extent on Burkburnett production for their crude. And the 85,000 barrels daily was far from being enough even though every barrel found its way into the refinery stills. When you take into consideration the pipe line runs, it becomes evident that possibly not more than 40,000 barrels of the already meager 85,000 barrels of crude is refined locally.

Premiums Are Asked

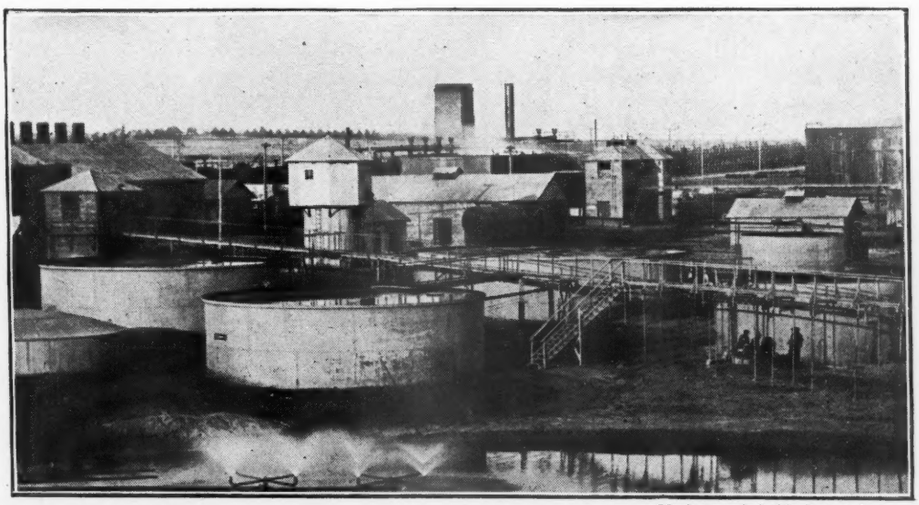
Several refineries are complete insofar as construction is concerned but they lack that stuff from which refined products are drawn. Few are operating to capacity. Contracts for crude usually call for premiums of more or less magnitude.

As pointed out the Wichita Falls district has been in the worst way as to refining. Plants in and around Fort Worth, Dallas and Central Texas are in a better fix, although not a few of them are without sufficient crude to keep their stills going at capacity.

The situation in the Gulf Coast section is somewhat better than in north and central west Texas. While several of the smaller plants were closed for a time, the refineries belonging to the larger companies have been getting the crude and turning out the refined products with regularity.

The Gulf Coast boasts of the largest plants in the state. Including the 8300 barrel daily capacity of refineries in the San Antonio district and the 66,600 "capacity being added", the total daily refining capacity of the coastal section of Texas is 277,600 barrels or somewhat more than 50 per cent of the state's capacity. In this district there are less than two

Photograph used at head of this page shows ships at docks near the Gulf Refining Company's Port Arthur plant. The refinery may be seen to the left in the background. Photo Allen, Houston.



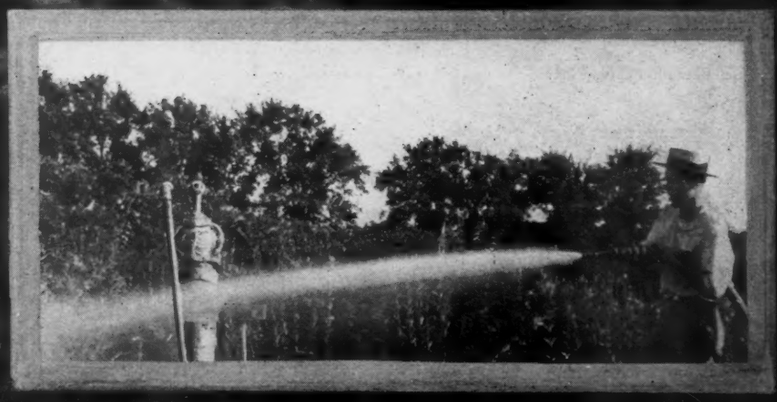
c, Underwood & Underwood

SINCLAIR REFINING CO.'S PLANT, NEAR CUSHING, OKLAHOMA

A New Achievement i

LINWOOD, KANSAS, gas well of the Atlas Petroleum Company, ignited by lightning. Although the flames are not visible in the photograph because of their light-bluish color, they are leaping 15 feet into the air and are extending from numerous connections. Firefoam 40-gallon Engine at left.

THE Firefoam 40-gallon Engine shooting Firefoam on the burning gases. In less than 60 seconds after the Firefoam Engine was brought into action, the fire was completely extinguished.



Cooling off the casing with Firefoam.

Foamite

Firefoam

in Fire-fighting

Heavy smothering blanket of Firefoam remains intact on the casing after the fire is out.

Three minutes after the fire had been extinguished and the Firefoam blanket partly removed, the casing had cooled to such an extent that the bare hand could be held on it.

Firefoam masters blazing gas wells in seconds and minutes —not hours

LIGHTNING struck the 5,000,000 foot gas well of the Atlas Petroleum Company at Linwood, Kansas, on July 2, 1920. The well was producing gas through a 6-inch casing with a pressure of 265 pounds.

The fire burned nearly 20 hours before a Firefoam 40-gallon engine could be brought from Kansas City and put into action. These five photographs tell the story of the fire and illustrate the remarkable performance of Firefoam, which completely extinguished the fire in less than 60 seconds.

Another Bad Gas-Well Fire Mastered

On August 13, 1920, a large gas well on the Ballany Lease, near Bethel, Kansas, caught fire, due, it is believed, to a lighted cigarette.

At this well gas was being produced through 6-inch casing from a depth of 300 feet. Here, also, the flames shot high into the air.

It was a difficult fire. Gas was escaping and igniting at two openings. A Firefoam 40-gallon Engine which had to be rushed to the scene of action from Kansas City, put out the fire almost instantly.

These were both bad fires. Serious loss was constantly threatened. Many attempts were made to get the fires under control by other fire-extinguishing methods. All failed but Firefoam.

Without Firefoam on the premises, your valuable properties are not adequately protected against the ever present menace of fire and lightning. Can you afford to take such a risk?

FOAMITE FIREFOAM CO.

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Sales Engineers in principal cities — Dealers everywhere

Smothers fire

dozen refineries. It takes the remaining 100 Texas refineries to furnish the other 50 per cent of the refining capacity.

Big Uns Near the Coast

Look at the size of some of the plants near the Gulf. At Port Arthur the Gulf Refining Company has a 60,000 barrel plant, The Texas Company a 36,000 barrel plant with a 15,000 barrel auxiliary at Port Neches. The Magnolia Petroleum Company maintains a refinery of 50,000 barrel capacity at Beaumont. The Humble Oil & Refining Company's plant on the Houston Ship Channel is not yet complete, although some of the stills are in operation. It will be of 60,000 barrels daily capacity when completed.

In and around San Antonio refineries are operating capacity on Somerset crude and oil shipped from other oil fields.

An idea of the growth of the oil industry, as measured by the state's daily refining capacity may be seen by a comparison of the present capacity, 541,650 barrels with the following list of Texas refineries published in a University of Texas bulletin in December, 1913:

Name and Location	Daily Capacity
Pierce-Fordyce Oil Association, Texas City.....	2,000
Pierce-Fordyce Oil Association, Fort Worth....	2 000
Gulf Refining Company, Port Arthur.....	30,000
Gulf Refining Company, Fort Worth.....	5,000
Magnolia Petroleum Company, Beaumont.....	20,000
Magnolia Petroleum Company, Corsicana.....	3,000
Texas Company, Port Arthur	18,000
Texas Company, Gates	15,000
Texas Company, Port Arthur	3,000
United Refinery Company, Beaumont.....	1,500
Webster Refining Company, Orange.....	500
Total	100,000

Louisiana Situation Good

Louisiana is credited with 29 refineries 21 of which are being operated compared with 15 which were in operation a year ago. This state, insofar as refineries are concerned, is unusual in that the capacity of plants under construction almost equals the capacity of the 21 plants which are now being operated. The operating capacity, as seen from the table, is 105,900 barrels daily while new plants with a total of 99,700 barrels daily capacity are planned or under the course of construction. This "building" item is given a considerable boost by the 60,000 barrel refinery which will be built at New Orleans by the Midco Oil Sales Company. Three 10,000 barrel plants and one 6000 barreler are being constructed or are planned for different points in Louisiana.

The capacity of plants now in operation, and those being built (including additional units being added to plants which are now running) totals 210,000 barrels daily. This gives an average of almost 7000 barrels for each of the 29 plants.

From advices given The OIL WEEKLY, very few refineries in Louisiana are standing idle, although a number of them are not running capacity.

Some Oklahoma Plants Idle

The refinery situation in Oklahoma is not dissimilar to that of Texas. With a daily capacity of 270,750 barrels, according to figures compiled by The OIL WEEKLY, there was a general tendency in the late summer to cut down the run, due possibly to shortage of production. While the daily production of Oklahoma probably exceeds the 300,000 barrel mark and while this would supply all refineries, it must be remembered that no little of the oil is handled by pipe lines and carried to refineries in other sections.

From the accompanying table, it may be seen that refineries in Oklahoma, actually completed and operating or capable of being operated, have a total daily capacity of 270,750 barrels. To this must be added 23,500 barrels daily capacity which represents the total capacity being added to present plants. The capacity of plants under construction, according to late figures, total 19,850 barrels. This gives a grand total of 314,100 barrels which will be the refining capacity of this state when additions and separate plants now under construction are completed.

One hundred and thirteen plants are included in The OIL WEEKLY figures. Toward the end of August 77 of these plants were handling 161,000 barrels of oil a day. The total capacity of the 77 plants in operation at that time totaled 235,000 barrels. There was a capacity of 74,000 barrels a day not being utilized by the companies in operation.

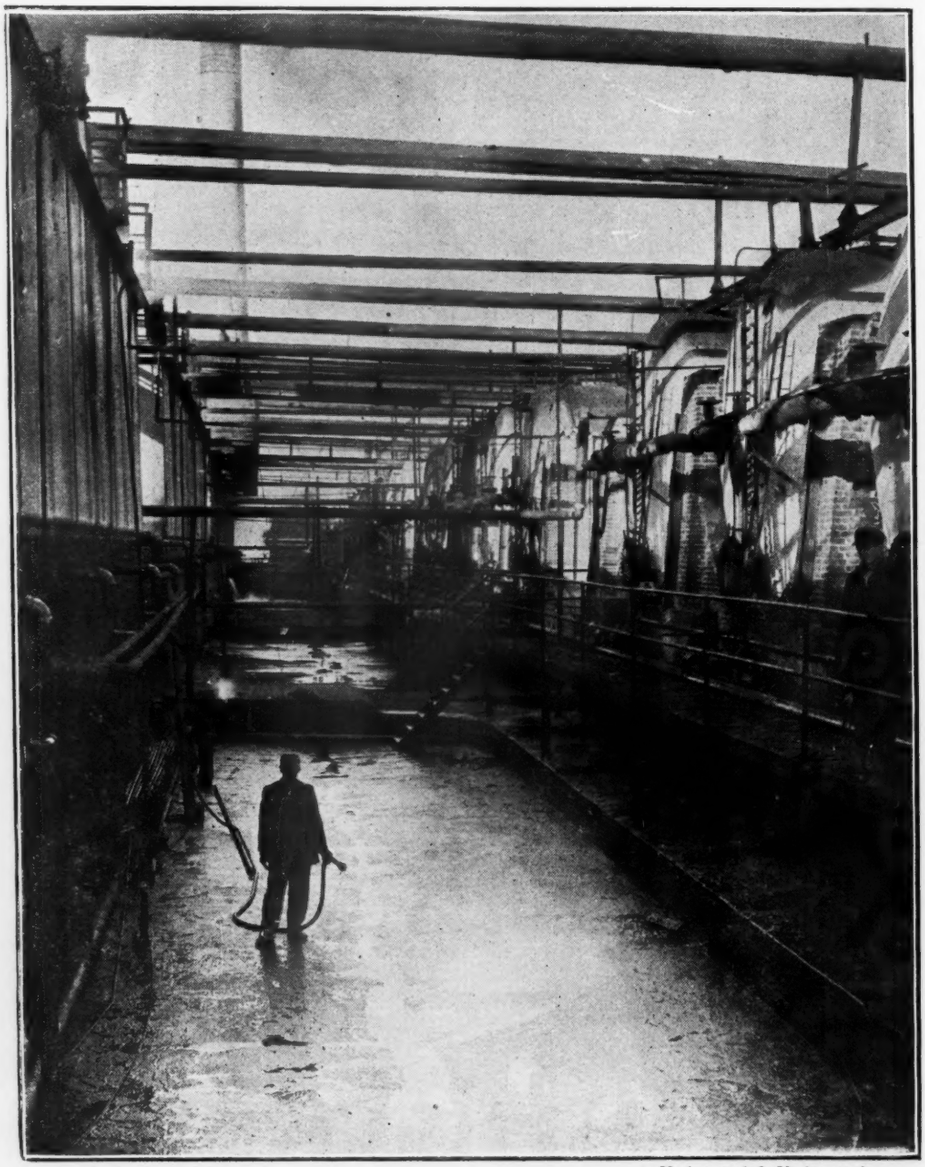
Only 68 Per Cent Operating

From these figures it may be seen that only 68 per cent of refining plants, numerically speaking, were in operation at this time and those in operation were running only 68½ per cent capacity.

Now as to what Oklahoma has done in the way of refinery building since last April when The OIL WEEKLY presented figures on the subject:

At that time Oklahoma was credited with 87 refineries with a total daily capacity of 248,900 barrels. There were 17 plants under construction with a combined capacity of 22,850 barrels. This would give a total of 271,750 barrels, as compared with the present capacity of 314,100 barrels. The capacity of refineries in operation or capable of being operated at this time lacks only 1000 barrels of equalling the 271,750 total announced last April for refineries both in operation and building.

Compared with the several refineries in Texas with capacities exceeding 50,000 barrels or more daily, plants in Oklahoma are exceedingly small, averaging less than 3000 barrels. The average capacity in Texas is almost 5000 barrels. The largest plant listed is the 22,500 barrel plant of Cosden & Company, located at Tulsa. The Carter Oil Company's plant in the same city is of 16,000 barrels capacity. Only one other plant, that of the Pierce Oil Corporation at Sand Springs exceeds the 10,000



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INTERIOR SCENE OF OKLAHOMA'S LARGEST REFINERY—COSDEN & COMPANY'S 22,500 BBL. PLANT IN WEST TULSA. BATTERY OF STILLS TO THE RIGHT

Petroleum Products

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A New Modern 4,000 Barrel Refinery; Experienced, Reliable Men in Charge. A Full Line of Modern Steel Tank Cars; A Very Efficient Traffic Department; Enable us to deliver unusually high grade products—promptly.

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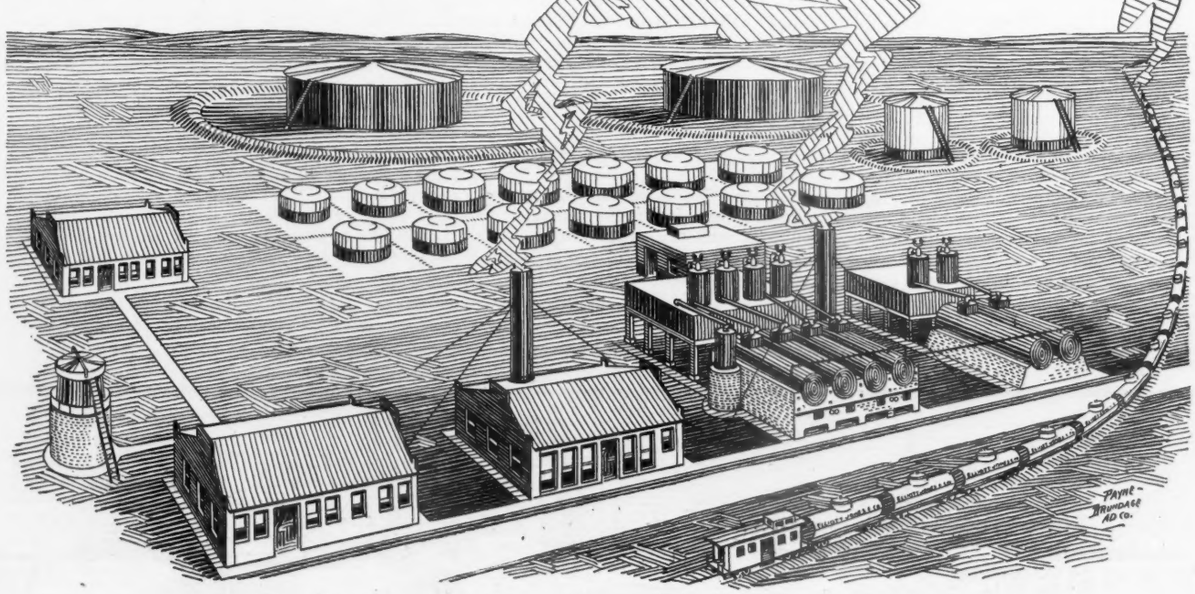
SAN ANTONIO
TEXAS



barrel mark. This refinery has a daily capacity of 12,000 barrels. The Mid-Co Company has a 10,000 barrel plant at West Tulsa and the Sinclair Refining Company has one of a like capacity at Vinita.

Kansas Records No Increase

Thirty-three refineries are ready to operate in the state of Kansas with a total capacity of 79,200 barrels. Compared with figures announced by the Bureau of Mines last January, this shows that practically no increase has been recorded. Three refineries are under course of construction. One has a capacity of 1000 barrels daily; figures for the other two were not available.

Only 25 Kansas refineries are operating and they are processing only 40,500 barrels a day. These figures were compiled at the same time a count was being taken in Oklahoma. It may be seen that only about one-half of the refining capacity is being utilized by the 75 per cent of the total number of plants in operation.

The list presented herewith for Kansas shows little change from that presented by the Bureau of Mines last January.

California Shows Increase

The OIL WEEKLY presented a list of California refineries in May of this year which applies almost without change at this date. There is an increase of more than 20,000 barrels in the total daily capacities announced by the Bureau of Mines in January and the list which is printed herewith. Forty-one refineries with a total daily capacity of 310,320 barrels was listed in the Bureau of Mines report, while The OIL WEEKLY figures show a total of 43 plants with a combined capacity of 333,655 barrels, which includes 3250 barrels being added to two plants in that state.

California is a state of "large" refineries, the average for the 43 plants being a little higher than 7750 barrels. The Associated Oil Company, The Standard Oil Company of California, The Shell Company of California, the General Petroleum Corporation, and the Union Oil Company of California all have large plants.

The Standard Oil Company has about completed its program for the year which includes 5000 and 6000 barrel additions in the form of cracking plants at El Segundo and Richmond, respectively. These improvements were not made so much for increased crude run capacity as it was for the installation of cracking units and other equipment. The Standard's total cost for this work was approximately $10,000,000.

The Associated Oil Company has completed all its improvements for the year. So far as The OIL WEEKLY'S representative at Los Angeles could learn, there were no expansion programs announced or contemplated for immediate activity.

Photo Allen, Houston.

TANKER AT THE HUMBLE OIL & REFINING COMPANY'S PLANT ON THE HOUSTON SHIP CHANNEL AT BAYTOWN. NOTE PIPES. A NUMBER OF REFINING PLANTS ARE LOCATED ON THE SHIP CHANNEL

Thirteen Plants In Wyoming

Wyoming is making remarkable strides as regards the refinery situation. The Bureau of Mines report of last January gave the total number of plants at 14, with four of these building. The capacity for both those in operation and under construction was 68,700. According to figures collected for this review, there are thirteen plants now in operation in Wyoming with a total daily capacity of 69,450.

This figure does not include an additional 18,350 barrels daily capacity which is being added to various refineries over the state. One refinery, the Midwest at Casper, now a 35,000 barrel plant, is ading units which will bring its capacity up to 45,000 barrels. The Standard Oil Company of Indiana's Casper plant, now a 12,000 barreler, will be increased to 19,000 barrels.

Indiana Has One Large Plant

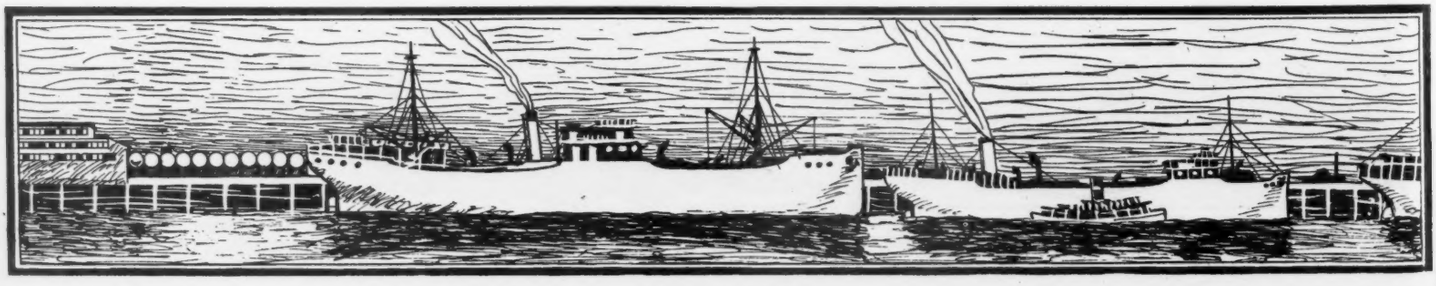
Take the Standard Oil Company's Whitting, Indiana plant from the Indiana list and you would "knock the props" from under the daily capacity total. That plant is capable of handling 40,000 barrels a day and represents almost 80 per cent of the state's refining capacity. The Sinclair Refining Company with a refinery located at East Chicago is rated at 10,000 barrels daily and is increasing to 16,000 barrels. A 500 barrel daily increase is being made possible by the addition of units to the Service Oil Refining Company's 700 barrel plant at Fairmount.

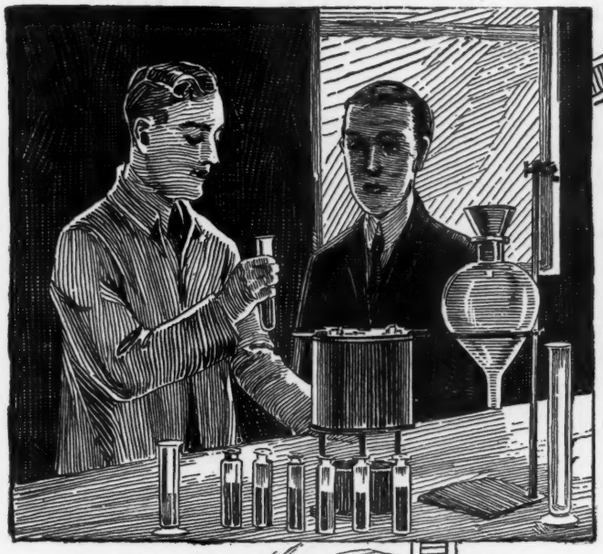
Illinois Somewhat Like Indiana

The refining situation in the state of Illinois is almost identical to that in its sister state, Indiana. The total daily capacity for each state is practically the same, around 54,000 barrels and according to information gathered the number of barrels (daily capacity) being added is exactly the same for each state—6500 barrels.

However, there are three times as many plants in Illinois as there are in Indiana, with only three plants being rated at capacities of 10,000 barrels or more daily. Included in those refineries making additions are the Roxana Petroleum Corporation which is increasing its Wood River plant from 10,000 to 15,000 barrels daily and the White Star Refining Company, with the same location, increasing from 1200 to 2500 barrels daily.

Complete statistics on refineries by states, together with a condensed summary, may be found beginning on page 130.—Editor.





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in the refining of Muskogee-Boynton-Morris crude into MUSKOGEE QUALITY products. Every car is tested by the O. P. & R. chemists, to make sure that it meets the high standard of quality set for our products, and samples of each shipment are retained in our laboratory.

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Our refinery superintendent KNOWS the Muskogee-Boynton-Morris crude from A to Z, and knows how to refine it to the same uniform quality—day after day. For nine continuous years, he has been producing "MUSKOGEE QUALITY" products from the same leases, same wells and the same premium crude, which is conceded to contain the highest quality lubricating base of any crude in Oklahoma.

What are your needs in Gasoline, Kerosene, viscous neutrals, non-viscous neutrals, Cylinder Stocks, Gas Oil, Fuel Oil and White Crude Scale Wax? Wire Us!

OKLAHOMA PRODUCING & REFINING CORPORATION of AMERICA

TULSA, OKLAHOMA

Say you saw it in THE OIL WEEKLY

REFINERIES OF THE UNITED STATES

Late Figures Show Immense Gain over Figures Announced January This Year

What is the latest and possibly the most complete list of refineries in the United States is to be found herewith. By extended effort The OIL WEEKLY has been able to revise and enlarge upon the figures announced by the Bureau of Mines in its January list. Figures in many cases have been changed. These represent increases made since the last list was published and in each case show the capacity as reported from sources believed by The OIL WEEKLY to have been authentic.—The Editor.

ARKANSAS

REFINERY	Operating	Capacity being added
Kalkhoff & Rebold, Fort Smith	600	

CALIFORNIA

Amalgamated Oil Co., Los Angeles (topping plant)	10,000	
American Oil Fields Co., Fellows	10,000	
American Petroleum Co., Coalinga	3,700	
Asphaltum Oil & Ref. Co., Los Angeles	500	250
Associated Oil Co., Avon	22,000	3,000
Associated Oil Co., Gaviota	10,000	
Calif-Fresno Oil Co., Fresno	500	
Calif. Oil & Asphalt Co., Vernon	885	
Capitol Crude Oil Co., Santa Paula	160	
Crescent Refining & Oil Co., Vernon	250	
Continental Pet. Refining Co., Coalinga	4,000	
General Petroleum Corp., Vernon	20,000	
A. F. Gilmore & Co., Los Angeles	1,000	
Gilmore Petroleum Co., Vernon	790	
Harbor Oil Co., Vernon	450	
Jordan Oil Co., Vernon	900	
King Refining Co., Kern River	250	
Pacific-American Pet. Co., Vernon	300	
Pioneer Paper Co., Vernon	400	
Producers Refining Co., Bakersfield	800	
Puente Oil Co., Chino	1,150	
Richfield Oil Co., Bakersfield	3,500	
Richfield Oil Co., Los Angeles	900	
St. Helens Pet. Co., Ltd., Fullerton	600	
C. L. Seager, Tulare	1,200	
Shell Co. of California, Coalinga	2,500	
Shell Co. of California, Martinez	30,000	
Standard Oil Co. of Cal., Bakersfield	20,000	
Standard Oil Co. of California, El Segundo (Cracking plant included)	60,000	
Standard Oil Co. of Cal., Port Richmond (Cracking plant included)	60,000	
Turner Oil Co., Los Angeles	1,150	
Union Oil Co. of Cal., Avon	17,000	
Union Oil Co. of Cal., Brea	10,000	
Union Oi lCo. of Cal., Maltha	3,000	
Union Oil Co. of Cal., Oleum	22,000	
Union Oil Co. of Cal., Santa Paula	800	
Union Oil Co. of Cal., San Pedro	12,000	
Union Pet. Co. of Cal., Rodeo	500	
Union Sales Corp., Vernon	700	
Ventura Ref. Co., Fillmore	3,500	
Vernon Oil Ref. Co., Vernon	1,500	
Wilshire Oil Co., Fellows	4,000	
Wilshire Oil Co., Vernon	1,100	
Total	330,435	3,250

COLORADO

*Raven Oil & Refining Co., Rangely	200	
*The United Oil Co., Florence	1,000	
Total	1,200	

GEORGIA

Atlantic Refining Co., Brunswick	5,000	

ILLINOIS

Central Ref. Co., Lawrenceville	4,000	
*Indiahoma Ref. Co., East St. Louis	4,000	
Indian Ref. Co., Lawrenceville	12,000	
*Inter Ocean Ref. Co., McCook	1,500	
*Leader Oil Co., Casey	300	
*McCombs Pet. & Ref. Co., E. St. Louis	1,000	
Prime Pet. Prod. Co., Blue Island	2,400	
Roxana Pet. Corp., Wood River	10,000	5,000
*Standard Oil Co. of Indiana, Wood River	12,000	
The Texas Company, Lockport	4,000	
Wabash Refining Co., Robinson	800	200
Warren Oil Co. of N. Y., Inc., Joliet	1,000	
White Star Ref. Co., Wood River	1,200	1,300
Total	54,200	6,500

INDIANA

Service Oil Refining Co., Fairmount	700	500
Sinclair Refining Co., East Chicago, Ind.	10,000	6,000
*Standard Oil Co. of Indiana, Whiting	40,000	
*Consolidated Oil Ref. Co., E. Chicago	3,000	
Total	53,700	6,500

KANSAS

Augusta Oil & Ref. Co., Augusta	1,000	
Commonwealth Oil & Ref. Co., Moran	800	
El Dorado Ref. Co., El Dorado	1,500	
Fidelity Ref. Co., El Dorado	2,500	
Golden Rule Refining Co., Wichita	750	
Goodeagle Ref. Co., Baxter Springs	1,000	
Great Western Oil & Ref. Co., Erie	1,500	
H. & H. Refining Co., Osawatomie	1,000	
Hutchinson Pet. Co., Hutchinson	1,000	
Kanotex Refining Co., Arkansas City	3,000	
Kansas City Refining Co., Kansas City	2,500	
Kansas Oil Ref. Co., Coffeyville	1,800	

*Figures from Bureau of Mines Report.
†Capacity unknown.

CONDENSED SUMMARY OF REFINERIES

	Number	Operating	Capacity being added	Building
Arkansas	1	600	.....	.....
California	43	330,435	3,250	.....
Colorado	2	1,200	.....	.....
Georgia	1	5,000	.....	.....
Illinois	13	54,200	6,500	.....
Indiana	4	53,700	6,500	.....
Kansas	36	79,200	.....	1,000
Kentucky	8	13,700	.....	.....
Louisiana	29	105,900	4,400	99,700
Massachusetts	2	15,000	.....	.....
Maryland	4	41,500	.....	.....
Minnesota	1	1,000	.....	.....
Missouri	6	19,375	.....	.....
Nebraska	2	1,500	1,000	.....
New Jersey	8	216,000	.....	.....
New York	6	31,000	.....	.....
Ohio	11	34,600	800	.....
Oklahoma	113	270,750	23,500	19,850
Pennsylvania	57	108,505	15,500	.....
Rhode Island	1	10,000	.....	.....
South Carolina	1	10,000	.....	.....
Tennessee	1	500	.....	.....
Texas	118	447,550	74,100	20,000
Utah	2	3,550	700	.....
West Virginia	5	8,125	.....	.....
Wyoming	13	69,450	18,350	.....
Totals	488	1,932,340	154,600	140,550

KANSAS—Continued

REFINERY	Operating	Capacity being added
Midland Ref. Co., El Dorado	3,500	
Miller Petroleum Co., Humboldt	1,000	
Mo-Kan Refining Co., Kansas City	750	
Mutual Oil Co., Chanute	1,000	
National Oil Co., Arkansas City	2,500	
National Refining Co., Coffeyville	3,900	
North American O. & R. Co., Rosedale	1,000	
St. Louis O. & R. Co., El Dorado	1,500	
Simms Petroleum Co., Arkansas City	4,000	
Sinclair Refining Co., Chanute	2,000	
Sinclair Refining Co., Kansas City	5,000	
Sinclair Refining Co., Coffeyville	3,500	
Standard Asphalt R. Co., Independence	2,500	
Standard Oil Co., (Kan.) Neodesha	12,000	
Sterling O. & R. Co., Wichita	3,500	
Tri-State O. & R. Corp., El Dorado	1,500	
Uncle Sam Oil Co., Cherryvale	1,500	
Universal Pet. Corp., Augusta	3,000	
Vickers-Marshall O. & R. Co., Potwin	1,000	
Western Ref. Co., Wichita	1,200	
White Eagle O. & R. Co., Augusta	5,000	
Total	79,200	

Building

Minnetonka Ref. Co., Humboldt	†	
Quaker 777 Oil Co., Wichita	1,000	
Reliance Ref. Corp., Wichita	†	
Total	1,000	

KENTUCKY

REFINERY	Operating	Capacity being added
*American Ref. Co., Bowling Green	2,000	
*Atlanta P. & R. Co., Bowling Green	†	
Aetna Ref. Co., Louisville	3,000	
Great Southern Ref. Co., Lexington	1,500	
*Neha Ref. Co., Compton Junction	800	
*Oleum Ref. Co., Pryse	600	
*The Petroleum Ref. Co., Latonia	800	
*Standard Oil Co. of Ky., Louisville	5,000	
Total	13,700	

LOUISIANA

Caddo Central Dil & Refining Co., Shreveport	3,500	3,000
Columbia Ref. Co., Lake Charles	800	700
New Orleans Oil Co., New Orleans	5,000	
Homer Ref. Co., Homer	1,000	
International Oil & Gas Corporation, Shreveport	300	700
Island Ref. Corp. Sarpy	5,000	
Liberty Oil Co., New Orleans	1,200	
Louisiana Oil Ref. Corp., Shreveport	1,700	
Mexican Petroleum Corp., Destrehan	10,000	
Paramount Pet. Co., Vivian	1,500	
Paramount Pet. Co., Lewis	6,000	
Paramount Pet. Co., Sheehan	6,500	
Pelican Oil & Ref. Co., Chalmette	500	
Red River Ref. Co., Crichton	2,200	
Rogers Ref. Co., Shreveport	1,200	
Shreveport Prod. Ref. Corp., Jewella	3,000	
Sinclair Ref. Co., Mereaux	10,000	
Standard Oil Co., Baton Rouge	40,000	
Sunset Ref. Co., Plaquemine	1,000	
Texas Company, Shreveport	3,000	
Union Ref. & Pipe Line Co., Oil City	2,500	
Total	105,900	4,400

Building

Associated Prod. & Ref. Corp., Monroe	10,000	
Associated Producers & Refiners Corporation, Mansfield	10,000	
American O. & R. Co., Natchitoches	1,000	
Great Southern Producing & Refining Co., Shreveport	1,500	
Gum Cove Oil Company, Vinton	1,200	
Louisiana Oil Refining Corporation, Gas Center	10,000	
Midco Oil Sales Co., New Orleans	60,000	
Morris Refining Co., Minden	6,000	
Total	99,700	

MARYLAND

*The Interocean Oil Co., Baltimore	1,000	
*Prudential Oil Corp. Fairfield	4,000	
Standard Oil Co. of N. J., Baltimore (Topping plant 26,000 bbls.)	33,500	
*The U. S. Asphalt Ref. Co., Baltimore	3,000	
Total	41,500	

MASSACHUSETTS

*Beacon Oil Co., Everett	10,000	
Mass. Oil Ref. Co., E. Braintree	5,000	
Total	15,000	

MINNESOTA

Pure Oil Co., Minneapolis	1,000	

MISSOURI

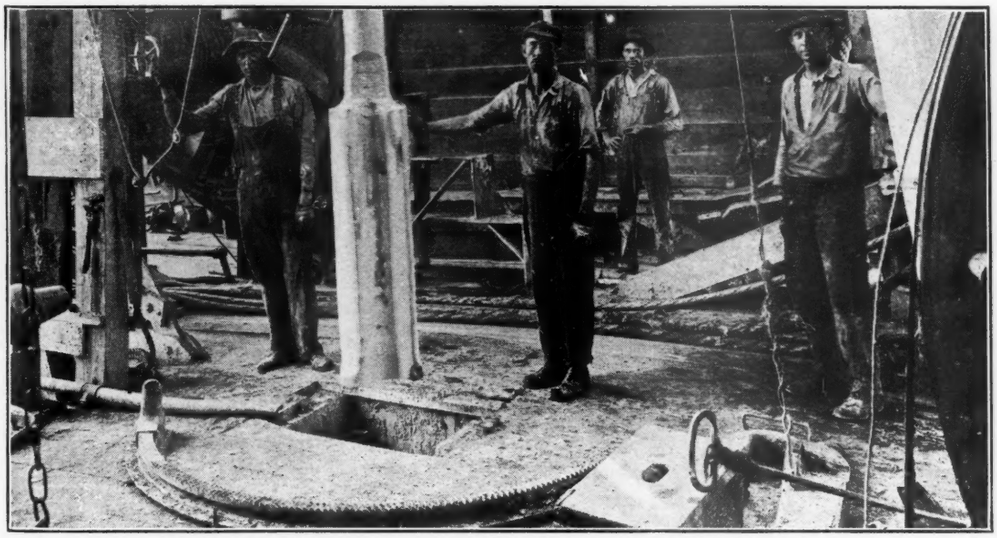
Lubrite Refining Co., St. Louis	1,000	
North American Oil & Refining Corporation, Kansas City	3,000	
St. Joseph Viscosity Oil Co., St. Joseph	500	
*Standard Oil Co. of Ind., Sugar Creek	12,000	
*Wilhoit Refining Co., Joplin	875	
Ranger Ref. & Pipe Line Co., Gate City	2,000	
Total	19,375	

NEBRASKA

L. V. Nicholas Oil Co., Omaha	500	
Omaha Ref. Co., Omaha	1,000	1,000
Total	1,500	1,000

NEW JERSEY

*Columbia Oil Co. of N. Y., Constable Hook	1,000	
Standard Oil Co. of N. J., Bayway (Topping plant 45,000 bbls.)	75,000	
Standard Oil Co. of N. J., Bayonne (Topping plant 58,000 bbls.)	88,000	
Standard Oil Co. of N. J., Jersey City	17,500	
Tide Water Oil Co., Bayonne	17,000	



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REFINERIES OF THE UNITED STATES

NEW JERSEY—Continued

REFINERY	Operating	Capacity being added
Vacuum Oil Co., Paulsboro	10,000	
Warner-Quinlan Co., Warners	2,500	
*Raritan Ref. Co., New Brunswick	5,000	
Total	216,000	

NEW YORK

*Standard Oil Co. of N. Y., Brooklyn		
*Standard Oil Co. of N. Y., Brooklyn		
*Standard Oil Co. of N. Y., Long Island City		
*Standard Oil Co. of N. Y., Long Island City	23,000	
*Vacuum Oil Co., Olean	7,000	
Wellsville Ref. Co., Wellsville	1,000	
Total	31,000	

OHIO

*The Canfield Oil Co., Cleveland	1,000	
The Craig Oil Co., Toledo	1,200	800
*Middle West Ref. Co., Columbus	400	
The National Ref. Co., Findlay	1,000	
*The Paragon Ref. Co., Toledo	2,500	
*The Rajah O. & R. Co., Youngstown	100	
*The Solar Ref. Co., Lima	6,500	
*The Standard Oil Co. of O., Cleveland	8,400	
*Standard Oil Co. of O., Toledo	3,000	
Sterling Oil Works Co., Marietta	500	
Sun Company, Toledo	3,000	
Total	34,600	800

OKLAHOMA

The Allied Refining Co., Okmulgee	1,000	500
American Oil & Tank L. Co., Cleveland	2,500	
Anderson & Gustafson, Inc., Cushing	1,000	
Arbuckle Ref. Co., New Wilson	500	
Ardmore Prod. & Ref. Co., New Wilson	2,000	
Atwood Ref. Co., Oklahoma City	1,250	
Bigheart P. & R. Co., Bigheart	3,000	1,000
Big Six Prod. & Ref. Co., Sapulpa	800	1,200
Bison Refinery Co., Quay	1,000	
Blue Ribbon Oil & Ref. Co., Walters	2,000	
Bolene Refining Co., Enid	1,000	
C. H. & W. Oil & Gas Co., Blackwell	2,500	
Cameron Ref. Co., Ardmore	3,000	
Canfield Refining Co., Yale	500	
Carbo Oil Co., Guthrie	1,000	
Champlain Refining Co., Enid	1,500	4,500
The Carter Oil Co., Tulsa	16,000	
Chickasaw Refining Co., Ardmore	5,000	2,000
Choate Oil Corp., Oklahoma City	2,000	1,500
Cherokee Refining Co., Oilton	1,000	
Constantine Ref. Co., Devol	3,500	6,500
Constantine R. Co., W. Tulsa (burned)	8,000	
Continental Refining Co., Bristow	2,500	
Consumers Oil & Ref. Co., West Tulsa	1,200	
Cosden & Co., West Tulsa	22,500	
Cushing Pet. Co., Oilton	1,000	
Cyril Refining Co., Cyril	300	300
James E. Dunn, Hominy	1,000	1,000
Dunn Refining Co., Bartlesville	1,500	
Empire Refineries, Inc., Cushing	2,000	
Empire Refineries, Inc., Cushing	2,000	
Empire Refineries, Inc., Oklahoma City	2,000	
Empire Refineries, Inc., Okmulgee	2,000	
Empire Refineries, Inc. Ponca City	2,500	
Federal Oil & Ref. Co., Cushing	500	1,000
Garber Ref. Co., Inc., Garber	500	500
Globe Oil & Ref. Co., Blackwell	2,000	
Gotebo Oil, Gas & Ref. Co., Gotebo	700	
Great American Ref. Co., Jennings	3,000	
Home Oil & Ref. Co., Yale	2,000	
Home Pet. Co., Oklahoma City	2,500	
Illinois Oil Co. of Rock Island, Cushing	2,500	
Imperial Ref. Co., Ardmore	4,000	
Indiahoma Ref. Co., Okmulgee	3,000	1,000
Inland Refiining Co., Cushing	2,500	
Interstate Oil & Ref. Co., Yale	1,500	
Kay County Ref. Co., Dilworth	800	
Lake Park Ref. Co., Ponca City	3,500	
Lake Park Ref. Co., Okmulgee	3,000	1,500
Livingston Oil Corp., Devol	3,000	
Lawton Ref. Co., Lawton	1,000	
Livingston Ref. Corp., Walters	3,000	
Marigold Oil & Ref. Co., Cushing	2,000	
Marland Ref. Co., Covington	1,000	
Marland Ref. Co., Ponca City	2,000	
Mid-Co Gasoline Co., West Tulsa	10,000	
Mid-Continent Ref. Co., Ringling	1,000	
Modern Ref. Co., Blackwell	1,000	
North American O. & R. Co., Pemeta	3,000	
Nyanza Ref. Co., New Wilson	1,250	
Occident Oil & Ref. Co., Cushing	1,200	
Ohio Cities Gas Co., Ardmore	7,500	
Ohio Cities Gas Co., Cushing	6,000	
Osage Mutual O. & R. Co., Pawhuska	1,000	
Oil State Ref. Co., Enid	2,000	
Oilton Ref. Co., Oilton	300	
Oklahoma Producing & Refining Co. of America, Muskogee	2,000	
Akmulgee P. & R. Co., Okmulgee	2,000	
Old Hickory P. & R. Co., Dilworth	800	
Oneta Refining Co., Oneta	1,200	
Pawnee Bill Oil & Ref. Co., Yale	1,600	
Pawnee Oil Ref. Co., Yale	2,000	

OKLAHOMA—Continued

REFINERY	Operating	Capacity being added
Phoenix Ref. Co., Sand Springs	5,000	
Pierce Oil Corp., Sand Springs	12,000	
Pirtle Pittman Oil Co., Newkirk	2,000	
Polar Prod. & Gasoline Co., Sapulpa	1,500	1,000
Producers & Ref. Corp., Blackwell	2,000	
Producers & Ref. Corp., Tulsa	6,000	
Rock Island Pet. Co., Guthrie	1,500	
Riverside Ref. Co., Oilton	800	
Sapulpa Ref. Co., Sapulpa	6,500	
Shaffer Oil & Ref. Co., Cushing	6,000	
Sinclair Ref. Co., Cushing	6,500	
Sinclair Ref. Co., Muskogee	600	
Sinclair Ref. Co., Vinita	10,000	
Southern Oil Corp., Yale	7,000	
Southern Ref. Co., Haskell	800	
Southwestern Oil Corp., Enid	1,500	
Sun Oil Co., Yale	3,000	
The Texas Co., Tulsa	6,000	
Transcontinental Oil Co., Boynton	1,250	
Tidal Oil Co., West Tulsa	†	
Universal Pet. Corp., Allen	2,000	
Victor Refining Co., Yale	1,000	
Worth Oil & Ref. Co., Yale	200	
Yale Oil Corp., Yale	1,200	
Total	270,750	23,500

Building

Bay State Ref. Co., Healdton	2,000	
Big Diamond Oil & Ref. Co., Addington	†	
Choctaw Refining Co., Oil City	50	
Duncan Ref. Co., Skelton	2,000	
Francis Oil & Ref. Co., Francis	1,000	
Frederick O. & R. Co., Frederick	1,500	
Golden Belt Ref. Co., Oklahoma City	800	
Grandfield O. & R. Co., Grandfield	3,000	
Greater Oklahoma Oil Corp., Billings	2,000	
Lawton Star Ref. Co., Lawton	1,000	
Motex Ref. Co., Devol	†	
Oklahoma Star Ref. Co., Frederick	†	
Oklahoma Texas Ref. Co., Grandfield	1,500	
Republic Ref. Co., Jennings	†	
Travis Oil Corp., Devol	5,000	
Total	19,850	

PENNSYLVANIA

*Amber Oil & Realty Co., Stoneham	75	
*American Oil Wohks, Titusville	2,200	
The Atlantic Ref. Co., Franklin	7,500	
The Atlantic Ref. Co., Philadelphia	45,000	15,000
The Atlantic Ref. Co., Pittsburgh	4,000	
*Beaver Ref. Co., Oak Grove	200	
*Butler County Oil Ref. Co., Bruin	800	
*The Canfield Oil Co., Coraopolis	400	
*Chippewa Oil Co., W. Bridgewater	200	
*The Chewango Ref. Co., Langdale		
*The Conewango Ref. Co., Warren	3,300	
*Continental Ref. Co., Oil City	750	
*Crew Levick Co., Titusville	800	
*Crew Levick Co., Titusville	800	
Crew Levick Co., Warren	680	
Crystal Oil Works, Oil City	1,000	
*W. H. Daugherty & Son Refining Co., Petrolia	200	
Emery Mfg. Co., Bradford	1,000	
Emlenton Refining Co., Emlenton	700	
Empire Oil Works, Oil City	700	
Foco Oil Company, Franklin	650	
Franklin Quality R. Co., Franklin	500	500
The Freedom Oil Works, Freedom	1,500	
*Glenshaw Dev. Co., Coraopolis	600	
Independent Ref. Co., Oil City	1,000	
Interior Oil & Gas Corp., Clarendon	700	
*Island Pet. Co., Neville Island	600	
*Kendall Ref. Co., Bradford	500	
*Manufacturers Paraffine Co., Chester	200	
*A. D. Miller's Sons Co., Pittsburgh	1,000	
*Mutual Ref. Co., Warren	500	
*Mutual Sales Co., Russell	500	
*Ohio Cities Gas Co., Marcus Hook	3,500	
Ohio Cities Gas Co., Warren	2,000	
*Penn-American Ref. Co., Rouseville		
*Penn-American Ref. Co., Oil City	3,000	
*Penn. Oil Prod. & Ref. Co., Eldred	800	
Petrolia Ref. Co., Petrolia	60	
*Pittsburgh Oil Ref. Corp., Corapolis	1,000	
*Seneca Oil Works, Warren	560	
Levi Smith Ref. Co., Clarendon	1,250	
Starlight Ref. Co., Karns City	100	
*Sun Company, Marcus Hook	8,000	
*Sunlight O. & G. Co., Philadelphia	130	
*Superior Oil Works, Warren	400	
Tidioute Ref. Co., Tidioute	800	
*Tiona Ref. Co., Clarendon	1,000	
Titusville Oil Works, Titusville	1,000	
*United Ref. Co., Warren	500	
*Valvoline Oil Works, Ltd., E. Butler	1,200	
*Vulcan Oil Ref. Co., Coraopolis	850	
*Warren Ref. Co., Warren	1,700	
*Waverly Oil Works, Pittsburgh	500	
*White Oil Corp., Clarendon	1,000	
*Wilburine Oil Works, Ltd. Warren	600	
Home Railway Oil Co. of Pennsylvania, Franklin	†	
*Oil Creek Ref. Co., E. Titusville	1,000	
Total	108,505	15,500

RHODE ISLAND

REFINERY	Operating	Capacity being added
*Standard Oil Co. of New York and East Providence	10,000	

SOUTH CAROLINA

Standard Oil Co. of New Jersey, Charleston	10,000	

TENNESSEE

*Victoria Oil & Ref. Co., Nashville	500	

TEXAS

Abner Davis, Trustee	2,000	
Arrow Refining Co., Waco	3,000	
American Ref. Co., Wichita Falls	5,000	
Aetna Petroleum Corp., Dallas	3,500	
Aetna Refining Co., Burkburnett	600	
Acme Refining Co., Burkburnett	1,200	
Reece S. Allen Ref. Co., Amarillo	3,000	
Alamo Ref. Co., Necessity	800	
Brownwood Ref. Co., Brownwood	500	
Baney Refining Co., Brownwood	500	
Beacon Ref. Co., Henrietta	2,000	
Beaver Valley Oil & Ref. Co., Cisco	†	
Bankers Ref. Co., Wichita Falls	1,500	
Buffalo Oil & Ref. Co., Sherman	500	
Beaver Electra Ref. Co., Electra	3,000	
Carson Refining Co., Brownwood	500	
Crude Oil Marketing Co., Burkburnett	3,000	2,000
Crescent Oil Ref. Ass'n, Houston	1,300	300
Crown Oil & Ref. Co., Houston	5,000	
Dublin Oil & Ref. Co., Dublin	4,000	
Duncan Oil & Ref. Co., Ranger	2,000	
De Leon Refining Co., De Leon	3,000	
Dixie Refining Co., Wichita Falls	1,000	
Deepwater Oil Refiners, Houston	1,200	800
Eastland Oil & Ref. Co., West Dallas	2,500	
Eagle Refining Co., Wichita Falls	3,000	
Elliott Jones & Co., San Antonio	4,000	
Four States Refining Co., Texarkana	500	
Federal Oil & Ref. Co., Fort Worth	3,000	
Gulf Ref. Co., Fort Worth	15,000	
Gulf Refining Co., Port Arthur	60,000	
Gorman Home Ref. Co., Gorman	3,000	2,000
Gem Refinery, Burkburnett	600	
Grayburg Refinery, San Antonio	1,800	
Galena-Signal Oil Co. of Tex., Houston	5,000	
Hercules Petroleum Co., Dallas	5,000	
Home Oil Ref. Co. of Tex. Fort Worth	5,000	
Housted & Tucker, NW. Burkburnett	500	
Humble O. & R. Co., San Antonio	2,000	
Humble O. & R. Co., Houston Channel	12,000	48,000
Hughes, Palmer et al, Houston	500	
Indiahoma Refining Co., Ranger	500	
Interocean Ref. Co., Burkburnett	1,500	
Invader Oil & Ref. Co., Burkburnett	3,000	1,000
Keen & Woolf, Houston	1,000	
K-M-A Refining Co., K-M-A Field	1,000	
La Porte Oil & Ref. Co., Houston	500	500
Liberty Ref. Co., Cisco	4,000	
Lone Star Oil & Ref. Co., Coleman	500	
Lone Star Oil & Ref. Co., Wichita Falls	4,500	
Magnolia Petroleum Co., Corsicana	2,500	
Magnolia Petroleum Co., Fort Worth	12,000	
Magnolia Petroleum Co., Beaumont	50,000	
Miller Refining Co., Wichita Falls	3,000	
Montrose Refining Co., Fort Worth	3,500	
National O. & R. Co., Humble	900	
New Tex Ref. Co., Wichita Falls	1,000	
Noble Oil & Gas Co., Burkburnett	6,000	
North Texas O. & R. Co., Greenville	2,000	
Nortex O. & R. Co., Burkburnett	2,000	
New Era Ref. Co., Iowa Park	2,000	
New-Tex Ref. Co., Wichita Falls	1,500	
Oriental Oil Co., Dallas	5,000	
Odessa Oil & Ref. Co., Ranger	1,000	
Pa-Tex Petroleum Co., Houston	1,000	
Pierce Oil Corp., Texas City	5,000	5,000
Pierce Oil Corp., Fort Worth	10,000	
Producers Ref. Co., Gainesville	13,000	
Power Oil Ref. Co., Wichita Falls	1,000	
Panhandle O. & R. Co., Wichita Falls	6,000	
Ranger Ref. & Pipe Line Co., Ranger	2,500	
Ranger Ref. & Pipe Line Co., Tiffin	2,000	
Rex Ref. Co., De Leon	3,000	
Rex Oil & Ref. Co., Sweetwater	500	500
Star Ref. Co., Fort Worth	1,000	500
Sabano Ref. Co., Gorman	†	
State Refining Co., Dallas	2,000	
Sunshine State O. & R., Wichita Falls	2,500	
Southwestern P. & R. Co., Wichita Falls	2,000	
Slimp Ref., San Antonio	500	500
Seaboard Oil & Ref. Co., Orange	2,500	
Sinclair Gulf Ref. Co., Houston	5,000	10,000
Sipe Springs Ref. Co., Sipe Springs	500	
Texas Oil & Gas Refs., Brownwood	3,500	
The Texas Company, Gates	14,000	
The Texas Co., Port Arthur	36,000	
The Texas Co., Port Neches	15,000	
Transcontinental Ref. Co., Ft. Worth	5,000	
Thrall Oil & Ref. Co., Thrall	300	700
T-B Refining Co., Ranger	2,000	
Texas Independent Pipe Lines Co., Abilene	400	

†Capacity unknown.
*Figures from Bureau of Mines Report.

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REFINERIES OF THE UNITED STATES

TEXAS—Continued

REFINERY	Operating	Capacity being added
Texhoma O. & R. Co., Wichita Falls	3,000	
Texhoma O. & R. Co., Iowa Park	3,000	
Tex Oil Ref. Co., Burkburnett	1,000	
Travis Ref., Burkburnett	1,000	
Trans-Atlantic Petroleum Co., Houston	1,500	1,000
U. S. Petroleum & Ref. Co., Sherman	†	
Turnbow Oil & Ref. Co., Houston	1,200	1,300
Uniform Gasoline & Petroleum Co., Burkburnett	4,000	
Victor Ref. Co., Burkburnett	1,000	
Western Oil Corp., Burkburnett	2,000	
White Eagle Ref. Co., Fort Worth	6,000	
Weatherford Ref. Co., Weatherford	750	
Wichita Ranger Oil & Refining Co., Wichita Falls	5,000	
Waggoner Ref. Co., Electra	2,500	
Walker Consolidated Oil Co., Iowa Park	3,000	
Total	447,550	74,100

Building

Breckenridge Gas & Refinery Co., Breckenridge	†	
Craven O. & R. Co., Jakehamon	3,000	
Economy Ref. Co., Cisco	†	
Farmers Oil & Ref. Co., Texarkana	1,000	
Federal Oil & Ref. Co., Marshall	2,000	
Keystone Ref. Co., Dublin	5,000	
Longhorn Ref. Co., Cameron	2,000	
North Texas O. & R. Co., San Antonio	2,000	
Rogers Ref. Co., San Antonio	1,000	
Republic O. & R. Co., West Dallas	1,000	
Seymour Prod. & Ref. Co., Seymour	2,000	
Victor Pipe Line & Refining Co., Breckenridge	†	
Victor Ref. Co., Hillsboro	1,000	
Total	20,000	

UTAH

Utah Oil Ref. Co., Salt Lake	3,500	700
*Dixie Oil Co., Virgin	50	
Total	3,550	700

WEST VIRGINIA

REFINERY	Operating	Capacity being added
Elk Ref. Co., Wier	1,125	
*Ohio Cities Gas Co., Cabin Creek Jct.	3,000	
Ohio Valley Ref. Co., St. Marys	1,000	
Standard Oil Co., of N. J., Parkersburg	2,500	
Warner-Quinlan Co., Cario	500	
Total	8,125	

WYOMING

Genearl Pet. Corp., Lovell	450	
McWhorter-Osage Ref. Co., Osage	250	750
The Midwest Ref. Co., Casper	35,000	10,000
The Midwest Ref. Co., Greybull	10,000	

WYOMING—Continued

REFINERY	Operating	Capacity being added
The Midwest Ref. Co., Laramie	4,000	
*Mutual Ref. & Prod. Co., Glenrock	2,000	
Northwestern Oil Ref. Co., Cowley	750	600
*Riverton-Wyoming Ref. Co., Riverton	2,000	
Standard Oil Co. of Ind., Casper	12 000	7,000
*Wind River Ref. Co., Lander	1,000	
Alliance O. & R. Co., Thermopolis	1,500	
Standard Reserve Oil Co., Le Roy	500	
U. S. Oil & Ref. Co., Moorecroft	†	
Total	69,450	18,350

*Figures from Bureau of Mines Report.
†Capacity unknown.

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Getting Best Results from Humble Crude

THE following tests, products obtained, percentages, etc., are the results of numerous distillations in Laboratory and Experimental Plant, and it is from the results of these distillations that an opinion is arrived at as to the probable treatment to which the crude oils will be submitted on a large scale, in order to obtain the most satisfactory financial results.

The final decision as to the best method of fractioning a crude oil, commercially, must be decided in any case by the market prices obtainable for the products, it is therefore, desirable that the results of the Laboratory fractionation of an oil should give results which are nearly as possible concordant to those which will be obtained when the oil is distilled on a large scale in the Refinery.

The great change in market demands may be noted by the following run made in 1907, the demand being at that time for kerosene and gas oil.

HUMBLE CRUDE

Gravity, 20.0 Beaume.
Sulphur, 2.23 per cent.
Color, black.

Distillation (Fire)

Cut	Per cent	Vapor Deg. Faht.	Still Deg. Faht.	Beaume Gravity	Per cent Sulphur
1	2.5	410	494	43.7	.761
2	2.5	415	508	39.4	.432
3	2.5	440	522	37.0	.545
4	2.5	455	538	35.6	.370
5	2.5	470	546	34.6	.484
6	2.5	480	558	33.0	.490
7	2.5	493	564	32.1	.527
8	2.5	500	574	31.1	.492
9	2.5	505	583	30.4	.320

22.5 per cent; Rerun stock; Gravity, 34.9 Beaume; Sulphur, .395 per cent; Treated with 10 pounds acid; Gravity, 34.9 Beaume; Sulphur, .260 per cent.

Cut	Per cent	Vapor Deg. Faht.	Still Deg. Faht.	Beaume Gravity	Per cent Sulphur
10	2.5	515	593	29.4	
11	2.5	530	602	28.7	
12	2.5	535	610	28.0	
13	2.5	535	618	27.7	
14	2.5	545	628	27.6	
15	2.5	550	636	27.3	
16	2.5	555	646	26.8	
17	2.5	560	654	27.6	
18	2.5	560	662	27.0	
19	2.5	580		28.2	
20	2.5	590		27.3	
21	2.5	600		29.4	
22	2.5	590		29.9	
23	2.5	595		28.4	
24	2.5	590		28.3	
25	2.5	590		28.2	
26	2.5	585		29.2	
27	2.5	590		30.5	
28	2.5	585		29.8	
29	2.5	590		28.8	
30	2.5	592		28.7	
31	2.5	628		30.6	
32	2.5	628		25.6	

57.5 per cent gas oil; Gravity, 28.3 Beaume; Sulphur, .495 per cent.

Residue, 20 per cent; Tar, coke and loss; Heavier than water.

22.5 Per Cent Re-run Stock. Re-run (Fire Distillation)

Cut	Per cent	Vapor Deg. Faht.	Still Deg. Faht.	Beaume Gravity	Per cent Sulphur
1	5	332	394	47.9	.565
2	5	354	406	44.0	.262
3	5	360	514	41.9	.258
4	5	374	522	40.8	.230
5	5	390	528	39.4	.215
6	5	396	534	38.4	.184
7	5	408	540	37.7	.170
8	5	416	546	37.0	.176
9	5	424	556	36.1	.150
10	5	432	564	35.3	.139
11	5	433	572	34.8	.153

55 per cent; Test distillation 39.3, .107; Treated with 5 pounds acid; Gravity, 39.2 Beaume; Flash, 108 degrees Fahrenheit; Fire, 138 degrees Fahrenheit; Viscosity, 325; Sulphur, .166 per cent; Color plus 25 Saybolt.

Lamp test—Good with low flame.

45 per cent residue; gravity, 29.8.

Total Percentages

Kerosene 12.375%
Gas Oil 67.625%
Coke, tar and loss 20.000%

100 %

Products decided upon according to market conditions

By F. N. Williams

Attention is called to the sulphur present in the oil as H_2S. This will be noticed in the original distillation of the crude and also in the re-run.

Tests of Various Samples of Humble Crude, From 1904 to 1918

Year	Gravity Beaume	Per cent Sulphur	Color
1904	26.7	1.01	Green
1905	22.2	2.40	Black
1905	20.9	2.38	Black
1906	21.0	2.53	Black
1906	25.8	.23	Green
1915	24.7	.147	Green
1918	23.6	.164	Green
1918	24.0	.218	Green

Distillation of 24.0 Gravity—1918 Stock

To 302°F. 0.0%
302°F. to 554°F. 29.0%
554°F. to 615°F. 56.0%
Bottom, 15 per cent tar.

Sample of above crude-vapors passed through one cracking tube under still—distillate 90 per cent—re-run to 400 degrees Fahrenheit vapor temperature. Overhead, 12.4 per cent. The fraction re-run to 350 degrees Fahrenheit vapor temperature, overhead 8.3 per cent of crude.

Gravity, 53.8; D. P., 400 degrees Fahrenheit.

Humble Crude Topped for Fuel Distilled In 5 Per Cent Fractions Taking a Total of 20 Per Cent Off Overhead—Gravity of Crude 24.0

Cut	Per cent	Vapor Deg. Faht.	Still Deg. Faht.	Gravity
1	5	422	491	40.3
2	5	466	518	35.1
3	5	487	540	32.0
4	5	505	559	30.2

Residue, 80 per cent; Gravity, 21.1 Beaume; Flash, 230 degrees Fahrenheit P. M.; Sulphur, .225 per cent; *Tar, 20 per cent; B. T. U. per pound, 19,180; B. T. U. per gallon, 148,165.

Tar by H_2SO4.

Reduction of heavy Humble Crude for lubricating oil. Tests of crude, Gravity 18.5—Flash 215 degrees Fahrenheit—Fire 265 degrees Fahrenheit, large amount of bottom steam carried. Fractionated in 2.5 per cent cuts.

Cut	Per cent	Still Deg. Faht.	Gravity	Flash	Viscosity
1	2.5	340	30.5		
2	2.5	360	29.2		
3	2.5	370	27.9		
4	2.5	385	27.1		
5	2.5	395	26.5		
6	2.5	405	25.5		
7	2.5	410	24.5		
8	2.5	415	23.9		
9	2.5	425	23.4		
10	2.5	438	22.8		
11	2.5	448	22.3	260	70
12	2.5	460	21.6	275	81
13	2.5	475	21.0	290	98
14	2.5	485	20.6	305	121
15	2.5	495	20.0	320	153
16	2.5	510	19.4	325	210
17	2.5	525	18.9	335	270
18	2.5	535	18.2	345	311
19	2.5	542	17.7	345	458
20	2.5	550	17.5	355	565
21	2.5	555	17.3	360	692
22	2.5	550	17.0	365	835
23	2.5	550	16.7	375	991
24	2.5	550	16.5	375	1240
25	2.5	560	16.1	390	1640
26	2.5	564	16.0	400	2107
27	2.5	572	15.8	400	2605
28	2.5	576	15.7	410	3283
29	2.5	580	15.4	410	3680
30	2.5	580	15.0	420	4000

Bottom 25 per cent; Gravity, 12.5 Beaume; Flash, 490 degrees Fahrenheit; Fire 560 degrees Fahrenheit.

NOTE—Flashes determined on Cleveland Open Cup—Viscosities—Saybolt Universal Viscosimeter at 100 degrees Fahrenheit.

Lubricating Stocks

Lubricating stocks from Humble crude of 24.0 gravity. Lubricating distillate made from the crude cut from 25.0 Beaume gravity at tail pipe to approximately pitch in still—yield 42 per cent of crude. Lubricating distillate is then re-run over 2 to 4 per cent of 30.0 Beaume. Caustic soda solution, maximum amount of bottom steam carried in still during re-run—all overhead to 23.5 gravity returned to gas oil.

Cut for Red Oil, At Tail Pipe

23.5 to 21.5 Be.
20.0 to pitch

Gravity 21.1.
Flash 335
Viscosity 207 at 100°F.
Pour 0°F.

Cut for Pale Oils, At Tail Pipe

21.5 to 20.0 Be.

Gravity 20.6.
Flash 385.
Viscosity 358 at 100°F.
Pour 15°F.

Lubricating oil direct from crude without re-running-in this case. The crude is run over 4 per cent of 30 Beaume. Caustic soda solution, and as much steam introduced through sprays as practicable. Gravity of crude 24.0 Beaume.

Cut	Per cent	Gravity	Flash	Saybolt Viscosity at 100°F.
1	2.5	40.1	75	29
2	2.5	36.2	100	29
3	2.5	34.3	130	30
4	2.5	32.9	140	30
5	2.5	31.8		32
6	2.5	31.0	165	33
7	2.5	30.2		34
8	2.5	29.4	180	35
9	2.5	28.9		35
10	2.5	28.4	195	35
11	2.5	27.8		37
12	2.5	27.3	205	38
13	2.5	26.8		38
14	2.5	26.3	230	39
15	2.5	25.9		42
16	2.5	25.3	240	43
17	2.5	25.0		46
18	2.5	24.5	255	51
19	2.5	24.1		56
20	2.5	23.7	270	61
21	2.5	23.8		63
22	2.5	22.7	290	83
23	2.5	22.4		103
24	2.5	22.1	315	120
25	2.5	21.7		173
26	2.5	21.5	350	198
27	2.5	21.0		285
28	2.5	20.5	375	365
29	2.5	20.3		435
30	2.5	19.5	385	770
31	2.5	18.9		1074
32	2.5	18.8	415	1515
33	2.5	18.7		1867

Red oil distillation 30 per cent; Color Lovibond 228; Treated with 15 pounds acid; Gravity, 21.1; Flash, 360; Viscosity, 288 at 100 degrees Fahrenheit; Color, 160; Pour, 0 degrees Fahrenheit.

Cut	Per cent	Gravity	Flash	Saybolt Viscosity at 100°F.
34	2.5	18.6	425	
35	2.5	18.4		
36	2.5	18.2	430	

Dark in color.
Bottom 15 per cent.

War Specification Lube

Lubricating oils from Humble crude manufactured to meet War Specifications, as follows:

Airplane Machine Gun Oil—Specification No. 3503, Fraction of Humble Lubricating Oil Submitted Amounting To 10 Per Cent of the Crude

Gravity 23.2 Beaume.
Flash 285°F. O. C.
Fire 335°F. O. C.
Viscosity 366, Saybolt at 40°F.
Viscosity 170, Saybolt at 70°F.
Viscosity 70, Saybolt at 100°F.
Pour 45°F.
Viscosity 50, Saybolt at 130°F.
Viscosity 35, Saybolt at 212°F.
Carbon .021 per cent.
Color 30 Lovibond.
Acidity, none.
This oil treated with 10 per cent of 66 Acid.

12.5 Per Cent Fraction Submitted To Meet Specification No. 3502, Motor Oil for Gasoline Engines

Gravity 21.3 Beaume.
Flash 350°F. O. C.
Fire 410°F. O. C.
Viscosity 615, Saybolt at 70°F.
Viscosity 209, Saybolt at 100°F.
Viscosity 104, Saybolt at 130°F.
Viscosity 42, Saybolt at 212°F.
Pour 0°F.
Carbon O. K.
Color 124 Lovibond.
Emulsion O. K.
This oil filtered only.

12.5 Per Cent Fraction To Meet Specification No. 3502—Medium Oil

Gravity 21.2 Beaume.
Flash 355°F. O. C.
Fire 410°F. O. C.
Viscosity 735, Saybolt at 70°F.
Viscosity 266, Saybolt at 100°F.
Viscosity 120, Saybolt at 130°F.
Viscosity 51, Saybolt at 212°F.
Pour 0°F.
Carbon O. K.
Color 148 Lovibond.
Emulsion O. K.
This oil filtered only.

12.5 Per Cent Fraction To Meet Specification No. 3502—Heavy Oil

Gravity 20.5 Beaume.
Flash 390°F.
Fire 460°F.
Viscosity 1635, Saybolt at 70°F.
Viscosity 481, Saybolt at 100°F.
Viscosity 196, Saybolt at 130°F.
Viscosity 53, Saybolt at 212°F.
Pour 0°F.
Carbon .066 per cent.
Color 296 Lovibond.
Emulsion O. K.
This oil filtered only.

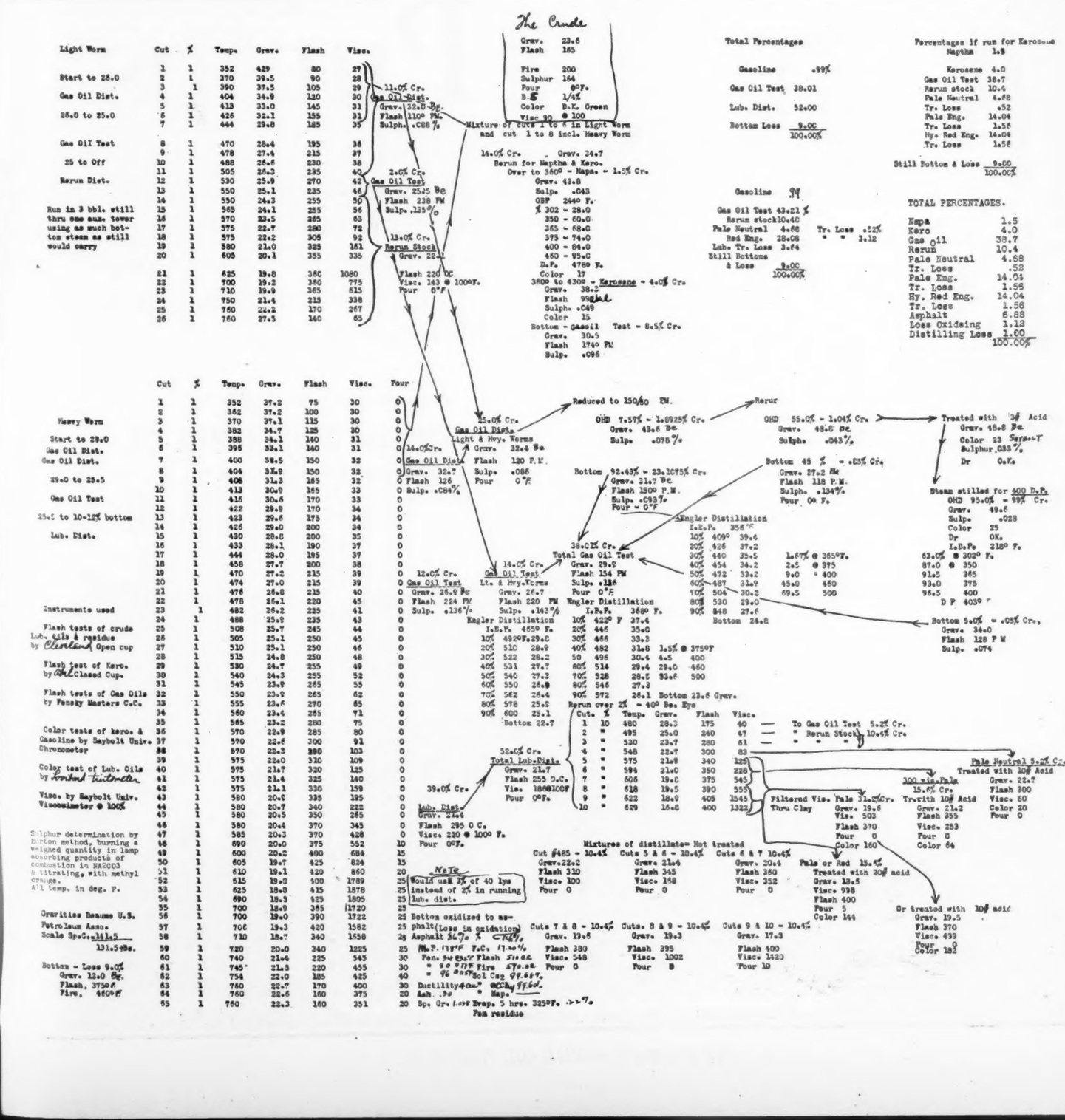
12.5 Per Cent To Meet Specification No. 3501 Liberty Aero Oil, But Too Light

Gravity 19.7 Beaume.
Flash 425°F.
Fire 495°F.
Viscosity 1205, Saybolt at 100°F.
Viscosity 412, Saybolt at 130°F.
Viscosity 67, Saybolt at 212°F.
Pour 0°F.
Carbon O. K.
Color 248 Lovibond.
This oil filtered only.

Oil To Meet Specification No. 3508—Gear, Chain and Wire Rope Lubricant. Manufactured From Southeast Texas Bottoms

Gravity 11.0.
Flash 505.
Fire 580.
Viscosity 1095 at 212°F. Saybolt.
Carbon tests by the Conradson method Emulsification.

The chart acompanying this article describes in detail the refining of Humble Crude, the crude in this case being spilt into 1 per cent fractions, the tests of each fraction given, the resultant mixtures for commercial products, the amounts of acid used in treating each product, etc.


The Crude
Gravity 23.6
Flash 165
Fire 200
Sulphur .164
Pour 0°F.
B.S. 1/4%
Color D.K. Green
Visc 92 @ 100
Total Percentages
Gasoline .99%
Gas Oil Test 38.01
Lub. Dist. 52.00
Bottom Loss 9.00
100.00%
Percentages if run for Kerosene
Naptha 1.5
Kerosene 4.0
Gas Oil Test 38.7
Rerun stock 10.4
Pale Neutral 4.68
Tr. Loss .52
Pale Eng. 14.04
Tr. Loss 1.56
Hy. Red Eng. 14.04
Tr. Loss 1.56
Still Bottom & Loss 9.00
100.00%
TOTAL PERCENTAGES.
Naptha 1.5
Kero 4.0
Gas Oil 38.7
Rerun 10.4
Pale Neutral 4.68
Tr. Loss .52
Pale Eng. 14.04
Tr. Loss 1.56
Hy. Red Eng. 14.04
Tr. Loss 1.56
Asphalt 6.88
Loss Oxidesing 1.13
Distilling Loss 1.00
100.00%
Light Worm
Heavy Worm
Mixture of cuts 1 to 6 in Light Worm and cut 1 to 8 incl. Heavy Worm
Reduced to 150/60 BM.
Rerun
Treated with 3# Acid
Steam stilled for 400 D.P.
Engler Distillation
Total Gas Oil Test
Gas Oil Dists.
Light & Hvy. Worms
Lub. Dist.
Instruments used
Flash tests of crude
Flash test of Kero.
Flash tests of Gas Oils
Color tests of Kero. & Gasoline by Saybolt Univ. Chronometer
Color test of Lub. Oils by Lovibond tintometer
Visc. by Saybolt Univ. Viscosimeter @ 100°
Sulphur determination by Eschka method, burning a weighed quantity in lamp consorbing products of combustion in NaCO3 & titrating, with methyl orange.
All temp. in deg. F.
Gravities Beaume U.S. Petroleum Assoc. Scale Sp.G.
Bottom - Loss 9.0%
Flash, 375°F
Fire, 460°F
Note
Would use 3% of 40 lye instead of 2% in running lub. dist.
Bottom oxidized to asphalt (Loss in oxidation)
Asphalt
Pale or Red
Filtered Vis. Thru Clay
Pale Neutral 5.2% Cr.
Treated with 10# Acid
Or treated with 10# acid
Mixtures of distillates Hot treated
Cuts 1 & 2 - 10.4%
Cuts 3 & 4 - 10.4%
Cuts 5 & 6 - 10.4%
Cuts 6 & 7 10.4%
Cuts 7 & 8 - 10.4%
Cuts 8 & 9 - 10.4%
Cuts 9 & 10 - 10.4%

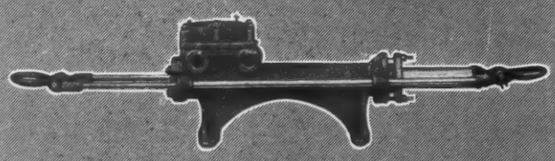


Fig. 201—3¾" X 30"
Gaso Rodline Pump

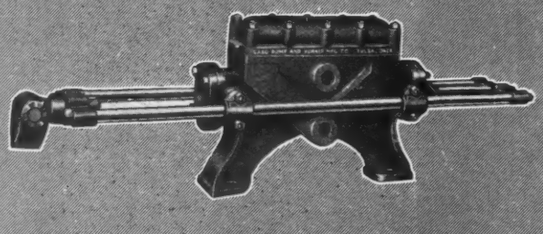


Fig. 301—3" and 3¾" X 24"
Gaso Piston Power Pump

Fig. 401—7½" X 2½", 3", 3½" and 5" X 10"
Gaso Dup. Piston Steam Pump

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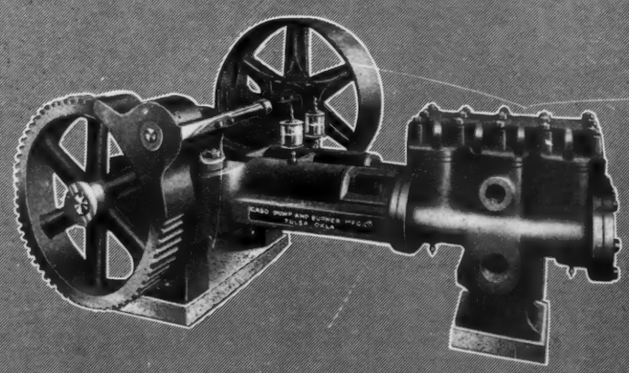


Fig. 501—2½", 3", 3½" and 5" X 10"
Gaso Horiz. Dup. Piston Gear Driven Pump

High Recovery of Oil in the Gulf Coast Fields

Fields Average from 40,000 to 160,000 Barrels to the Acre

By John R. Suman

Much has been said as to the comparative profit in producing oil in the Gulf Coast section and elsewhere. Until recently the low price of Coastal crude was a handicap. Now that the price is up practically to the level of high gravity crude, the accompanying article on the recovery per acre is especially interesting. Mr. Suman is assistant to the president of the Rio Bravo Oil Company and the East Coast Oil Company of Mexico.—Editor.

ONE of the contemporary oil publications recently carried an article describing the very high recovery of oil per acre at Ranger on the Taylor lease of the Gulf Production Company. This recovery was given as around 8400 barrels per acre and this is considered to be a very high recovery for the North Texas black lime producing territory. It was further shown in this article that the production per acre from surrounding leases had been as low as around 4000 barrels per acre. Geologists who have given much thought to the subject now seem to be of the opinion that in the present proven producing pools of the black lime area that an average recovery of 4000 barrels per acre will not be exceeded.

It is the object of this paper to show the relative desirability of producing acreage in the Gulf Coast section as compared with the black lime area of North Texas. In 1918 the oil fraternity became over enthusiastic as to the value of acreage in North Texas and some exhorbitant prices were paid. In the Gulf Coast region high price acreage crazes are quite common and enormous prices are sometimes paid for one acre or one quarter acre tracts. We shall attempt to show, that, considering the recovery per acre, high prices are much more justified in the coastal section than in North Texas.

We have taken production statistics up to the end of 1918 from the government reports and added the 1919 production as given in the Oil Weekly. The producing acreage is gotten by drawing a line around the field 300 feet outside the outermost producing wells and calculating the area enclosed in this manner. The areas in some instances are rather roughly measured on account of difficulties encountered in enclosing isolated wells; but they are close enough to bring out the features which it is desired to emphasize.

The total production and producing acreages are tabulated below:

Field	Producing Acreage	Total Production to Dec. 31, 1919 Barrels	Production per acre to date Barrels	Daily Production 9-1-20 Barrels
Spindle Top	330	46,727,454	141,598	800
Batson	710	29,860,805	42,055	1,100
Sour Lake 1,120		56,555,210	50,496	6,100
Humble 4,050		80,856,190	19,990	15,000
Goose Creek ...	840	24,040,170	28,619	16,000
Saratoga	640	19,615,537	30,647	1,700
Total 7,694		257,655,366		40,600

Average Recovery Per Acre 52,681 Barrels

It will be noted that these old fields, all of which, except Goose Creek, are at least 15 years old, are still producing 40,000 barrels of oil per day. We are wondering what the daily production of the black lime area will be in 12 to 15 years.

Data on the West Columbia field is not included in this table because of the fact that it has been producing for such a relatively short time that the exact boundaries of the producing area have not been clearly defined. This was shown quite forcibly when the No. 1 Abrams well of The Texas Company came in. Prior to the bringing in of the Abrams well and considering the producing area as confined to the sixty odd acres on the eastern side of the dome the recovery per acre figured around 150,000 barrels per acre.

It is quite a debatable question as to the amount of territory one well will drain in the Gulf Coast section. The old "cap rock" wells undoubtedly drained a much larger area than the wells since brought in which produce from sands. Some competent operators are of the opinion that owing to the lenticular nature of the sands encountered in the coastal fields that wells should be spaced closer together than in almost any other territory. In some of the fields it is considered very good practice to drill one well to each acre in order that no lenticular sands be passed up. Nevertheless the drilling has been overdone in almost every gulf coast field because of the small tracts into which the acreage has been sub-divided. It is quite probable that three times the necessary number of wells have been drilled at Spindle Top and at Batson, Goose Creek, Sour Lake, and Vinton over twice the number of wells necessary to drain the area have been drilled. The amount of money wasted in this procedure is enormous, and as far back as 1918 it was considered to be over $20,000,000.00.

In other words it is calculated that, on the average, one well every 1.8 acres will thoroughly drain the coastal fields. In North Texas it is now considered that one well to every 12 acres is sufficient and in some cases one well every 40 acres.

Much has been said as to the flooding of producing sands by rapid and injudicious drilling in the Coastal fields and there may be some justification for it. However, encroaching water is to be expected where sands are being rapidly drained of their oil content and gas pressures are being lessened. Technical supervision avails but little where such practices are allowed to continue.

In arriving at the number of wells necessary to drain an area no consideration is taken of wells poorly drilled in which strainer was incorrectly set or wells in which strainer has become clogged or eaten out; conditions which require re-drilling of locations or working over of wells. By careful technical supervision of drilling wells such as the state of California exercises incorrect settings could be done away with. Much more re-drilling is necessary in the Coastal country, however, than in any of the other fields of the United States.

It might be of interest to compare yield per acre of the gulf coast fields with that of other fields.

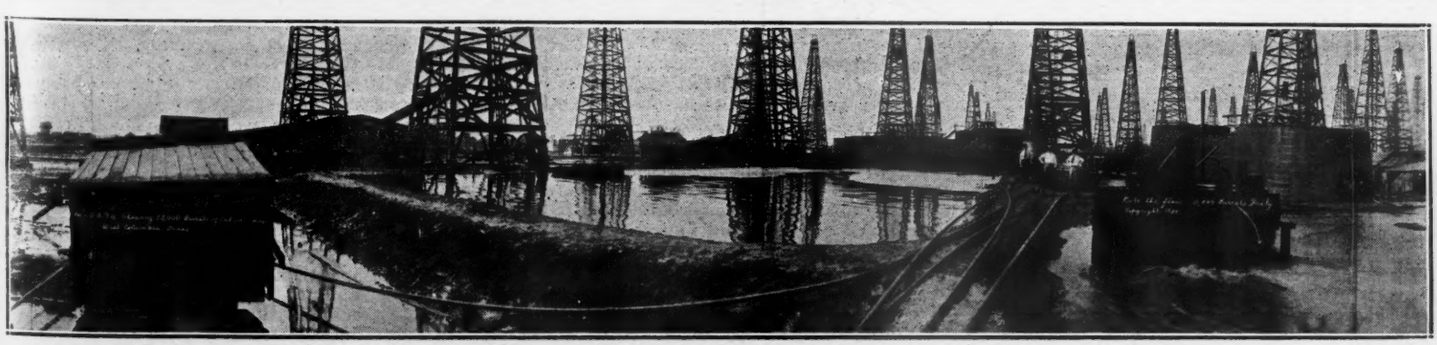
Comparison With Yield of Other Fields

The Pennsylvania fields have been estimated by State Geologists to yield 1,500 barrels per acre and for West Virginia estimates have been given showing the fields capable of yielding 4,900 barrels per acre. In Illinois the fields are thought to be capable of yielding 7,500 barrels per acre. The Canadian fields are supposed to have yielded 375 barrels per acre.

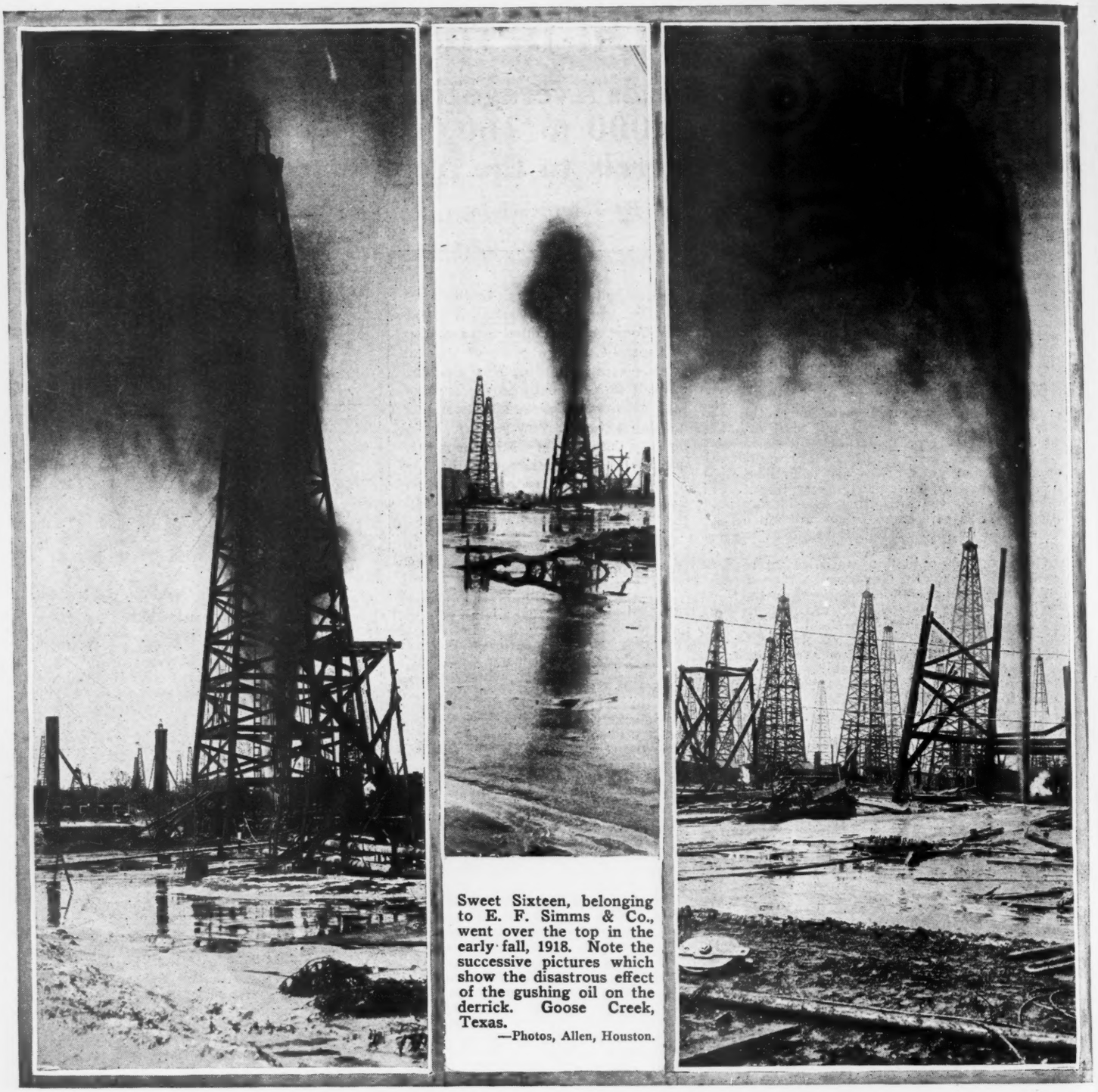
The Kern River fields in California comprising 6400 acres have yielded over 30,000 barrels per acre from 2000 wells. The oil sand averages 325 feet thick. The McKittrick field comprising some 900 acres has yielded over 42,000 barrels per acre. This latter field has been drilled up to the extent of one well every 3.3 acres. The Coalinga field, also in California, although only drilled up to the extent of one well every 14 acres has yielded about 10,000 barrels per acre. This latter field still produces 16,000,000 barrels annually, and comprises an area of about 14,000 acres.

Yield of Mexican Fields

No figures are at hand showing the yield per acre of the Mexican fields but when compiled it is quite possible that it will exceed that of any other district in the world. It is extremely difficult to figure the amount of acreage drained by one well in Mexico owing to the fact that the production, for the most part, comes from a porous limestone. Single wells in Mexico have been known to produce



VIEW AT WEST COLUMBIA, IN THE TEXAS GULF COAST SECTION



Sweet Sixteen, belonging to E. F. Simms & Co., went over the top in the early fall, 1918. Note the successive pictures which show the disastrous effect of the gushing oil on the derrick. Goose Creek, Texas.

—Photos, Allen, Houston.

as much as 60,000,000 barrels of oil before going to water.

Comparison With Foreign Fields

According to Mr. A. Beeby Thompson the Bushtenari field of Roumania was estimated in 1905 to be capable of yielding 67,500 barrels per acre. Mr. Thompson in his book entitled "Oil Field Development" goes on to say:

"The Baku oil fields of Russia supply the most startling figures of capacity. A single plot of 27 acres in Bibi-Eibat (Plot XIX. of The Russian Petroleum Company, Ltd.) has produced in thirty-six years over 60,000,000 barrels of oil from about sixty wells, or 2,200,000 barrels per acre, and in 1914 still yielded 470,000 barrels. This of course is no criterion of the general richness of the field, and only illustrates features explained on pp. 148-49, but it proves the wonderful capacity of oil land under certain circumstances. The oil extracted would fill a reservoir equal in area to that of the property to a depth of 270 feet. The Bibi-Eibat oil field, with an approximate area of 250 acres, has produced 1,200,000 barrels of oil per acre, and in 1914 an output of 7,700,000 barrels was recorded.

From the Balakhany-Saboontchy-Romany field of Baku, with an area of about 2,500 acres, excluding Surakhany, which extends to the southeast, has been obtained 1,125,000,000 barrels of oil; in round figures 450,000 barrels per acre. In 1914 this area yielded 29,000,000 barrels of oil. The oil withdrawn from this rich field would fill a receptacle equal in area to that of the field to a depth of 57 feet.

Roumania furnishes examples of extremely rich oilfields. An area of about 130 acres at Moreni has in ten years given 30,000,000 barrels of oil, or 225,000 barrels per acre. In 1913 the total was 7,350,000 barrels, or 52,500 barrels per acre. Galicia supplies one example of fame—the Boryslav-Tustanowice oil field—where 90,000,000 barrels of oil have been abstracted from about 1500 acres, or 60,000 barrels per acre. Six million seven hundred and thirty thousand barrels of oil were raised from this field in 1913, indicating its remoteness from exhauston.

In Russia

A single sand in the Maikop oil field of Russia has produced 82,500 barrels per acre, about 2,355 barrels per acre foot, or 30.4 per cent by volume on the irregular area over which it has been located by drilling, and was in 1913 still producing 600,000 barrels per annum. Average Peruvian oil fields appear to

(Continued on Page 142.)

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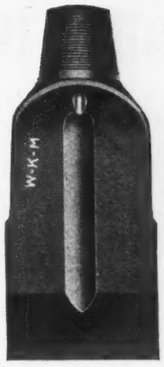
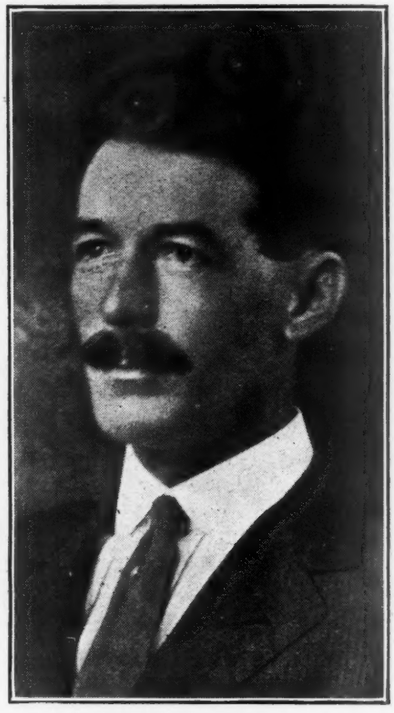


W-K-M Tool Joints

guaranteed not to stick. They have a heavy round top thread, which will not hook. Pins are specially heat treated, and threads are guaranteed not to break off. They are easy to break out, and you will not have any trouble with your tongs slipping as you have had with other joints. Also have a two and a half inch water course, which allows space for cartridge in case of shooting.



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are made from high grade steel, which is run at the mill to our special analysis, and they have been given a thorough test. They will make more hole per pound than any other bit made. If you are not using W-K-M Bits, we are both losing money. Let us have your next order, and you will be another satisfied W-K-M customer.

Due to the years of personal operation of machine shops by Clint Williams in the oil fields of Texas and Louisiana, and his close association with men who use Bits and Tool Joints, the W-K-M Tool Joints and Bits are recognized as the BEST and MOST PRACTICAL on the market.

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Driller Boasted He Would Strike "Salt or Hell;" He Got Surprised

BURKESVILLE, KY., Oct. 15.—In face of the claims of the Appalachian states New York and Pennsylvania which are usually credited with producing the first American oil in 1859, Kentucky comes forth with her "old American" oil well and asks for consideration. Three miles north of this village on Little Renox Creek, a prospector for salt—back in the year 1829—decided he "would hit salt or drill into hell."

Some time afterwards, so the story goes, when he struck oil it burst forth with the fury of a volcano and ran down Little Renox Creek into the Cumberland river. To add to the realism, and to make the driller think twice of his boast of hitting salt or the infernal regions, the oil caught on fire. The river seemed aflame. The driller departed without leaving his forwarding address. Tradition has it that he ran all the way to Barren County and took refuge in a cavern where he died for want of food and water.

At the time it was drilled, the "old American" well was several feet from the banks of the Little Renox Creek, but during the 91 years which have elapsed, the river has changed its course and now the oil well site is at the edge of the water. When the accompanying photograph was made, the water was flush and covered the site.

The oil does not boil up from the hole all the time, but flows at intervals of several weeks apart. Reports show that this well prior to 1860 produced about 50,000 barrels of high-grade green oil, thought to be full of gasoline.

This county has barely been tested for oil. A few wells have been drilled along the river where machinery could be unloaded from steamboats. Some oil has been found in most of these holes.

One well was brought in many years ago on Crocus Creek, which, according to authentic reports, made 1800 barrels a day, the largest daily production of any well ever drilled in Kentucky. Many other more or less famous wells have been brought in in this county. Inhabitants feel that if this country were not so remotely situated developments of its petroleum possibilities would be in full swing. The H. C. of Oil, likely, will remedy this to some extent and immediate developments are looked for.

OIL FROM OLD AMERICAN WELL ON WATERS OF LITTLE RENOX CREEK, KENTUCKY

Havre-Paris Pipe Line Will Be Built of French-Made Materials

WASHINGTON, D. C., Oct. 15.—A pipe line with necessary pumping stations is to be built between Havre and Paris by the Francaise des Transports de Mazouts et Petroles, under a concession recently granted by the French government, according to a report received by the Department of Commerce. The pipe line is to be built for the purpose of conveying oil from the sea coast to Paris and intermediate points.

In submitting the concession to the president, the Minister of Public Works called attention to the fact that owing to the shortage of coal it has been found necessary to employ crude oil for both industrial and domestic purposes. The present association contemplates only the transportation of crude oil through the pipe line system, but gasoline may later be added as a subsidiary concession.

The principal points of the concession are as follows:

1. The pipe line is to pass through or near Bolbec, Yvetot, Barentin, Rouen and Pontoise.

2. When desirable, the company may be allowed to lay the pipe along established public roads.

3. The line must be capable of conveying a minimum of 2400 metric tons of oil daily from a point situated in the neighborhood of Havre to a point in the neighborhood of Paris.

4. Reservoirs capable of holding a minimum of 60,000 tons must be built at each end of the line.

5. Within two months from the date of granting the concession, plans for the system must be submitted, and within a year from the date of approval of such plans, the pipe line must be ready for operation.

6. The company holding the concession is not obliged to accept for transportation oil weighing less than 6000 tons.

7. The company is authorized to charge a maximum of 46 francs per ton for transportation of oil, the rate being subject to increase or decrease by the Ministry of Public Works as it may be found necessary on account of the cost of labor or other items entering into the account.

8. Charges may be made by the company for storing oil in reservoirs at Havre and Paris as follows: 10 centimes per ton per day for the first five days; 15 centimes per ton per day for the next ten days; 20 centimes per ton per day for each day after the fifteenth.

9. The company is not obliged to keep oil in their reservoirs for more than fifteen days. After this period, and on four days' notice, they have the right to have the oil still in the reservoirs sold at auction.

10. A rebate of five per cent on the maximum rate shall be accorded to transportation for the account of the state or other public service uses. If necessary, the company may be called upon to reserve one-tenth of its transportation capacity for public use.

11. The duration of the concession is for a period of 50 years.

12. At the end of this period the state may take over without payment the pipe lines and pumping stations, the installations at points of departure and arrival, and the reservoirs. If there be any other installations, which the state desires to take over, it may do so upon the payment of an agreed sum.

13. As indemnity for the occupation of public property, the state shall receive the following amounts: three centimes per metre for the canalization and one franc per square metre of surface land taken up by installations other than the pipe line itself.

14. The state will also collect a proportional tax of one centime per ton transported, calculated upon the amount of oil leaving the initial station.

15. The state will likewise participate in profits as follows: The stockholders will first receive a rate of interest equal to that paid on French Rentes paying the highest rate of interest plus two per cent additional interest. On the profit made over this amount the state will receive 10 per cent on surplus profit amounting to between two and ten per cent on the capital stock; 20 per cent of the amount between 10 and 20 per cent on the capital; 40 per cent on the amount between 20 and 50 per cent on the capital, and 50 per cent on the amount over 50 per cent on the capital.

16. The company must only employ materials in the construction of the line produced by French companies operating in France. Permission to purchase materials manufactured abroad may be obtained from the Ministry of Public Works if it can be shown that it is impossible to procure such materials in France at reasonable prices and reasonable terms of delivery.

Roumania's oil production dropped from 10,298,208 barrels in 1916 to 2,681,870 barrels the subsequent year.

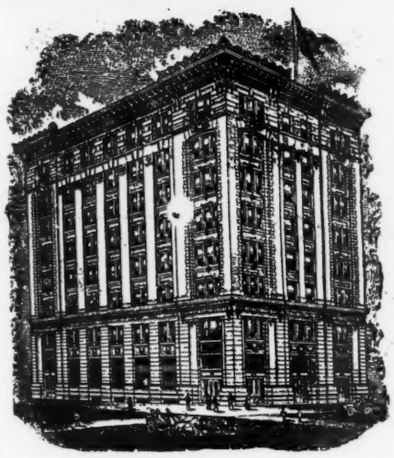
Although Italy has been producing oil since 1860, the grand total is under a million barrels.

HIGH RECOVERY OF OIL IN GULF COAST FIELDS

(Continued from Page 140.)

have a capacity of from 7,500-23,500 barrels per acre, but areas of increased enrichment have been struck.

Mr. I Streezhoff in 1910 placed the yield of Grosny (Russia) oil properties at 3,500,000 poods per dessiatine, or 157,000 barrels per acre, and stated that from the Akhverdoff property 7,000,000 poods a dessiatine had been extracted, equal to 310,000 barrels per acre. The total capacity of 1,600 dessiatines (4,300 acres) at Grosny was estimated at 11,200,000,000 poods equals 1,350,000,000 barrels, equal to 300,000 barrels per acre.



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FRANKLY, it is with the spirit of boastfulness that we make this announcement:

The first plant employing The Sharples Process for The Separation of Amorphous Wax from Cylinder Stock in the manufacture of bright stock, has now been in operation for three months for the Kendall Refining Company, Bradford, Pa.

The finished bright stock as produced has, without exception, from the day the first barrel was produced, shown a pour test varying from 20° to 25°.

The amorphous wax produced by the process has a melting point of 130° to 135°.

The increased yield in finished cylinder stock over the best produced by cold settling has amounted to 25%.

The cost of the plant and the cost of operating it has been less than in the case of cold settling.

We are in a position to furnish complete specifications and drawings together with detailed operating information on plants of any capacity requirements.

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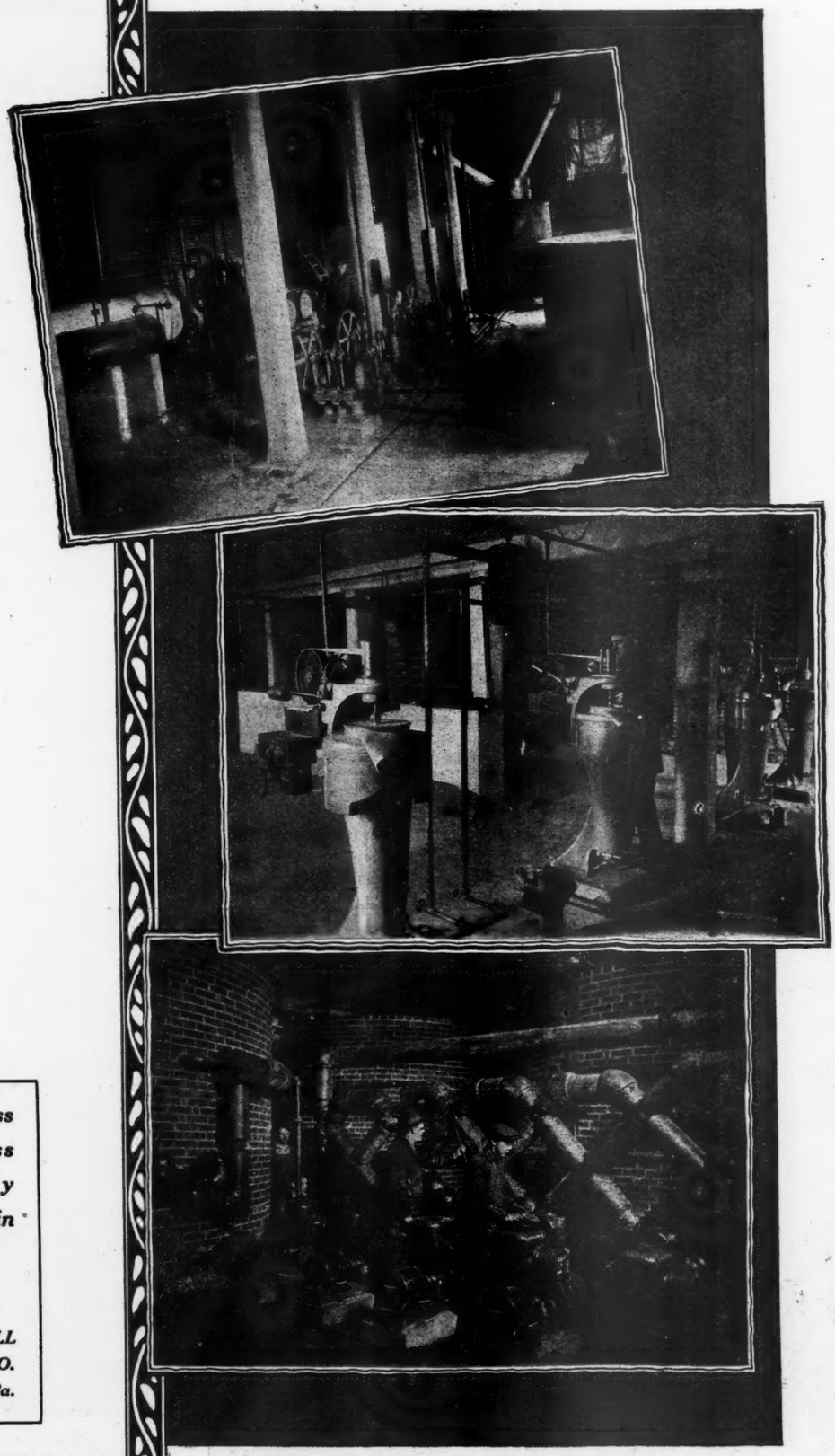


"The process is a success and highly satisfactory in every way."

Otto Koch,

Pres. KENDALL REFINING CO.
Bradford, Pa.

Ridding Oil Emulsions of Water Content

Different Methods Dehydration Used in Various Fields

By Silas B. Ragsdale

The problem of dealing with water emulsion and b. s. is a problem faced, eventually, by every oil producer if he continues to own production in the same field. The presence of water with oil is almost axiomatic, and whether the field be Pennsylvania, Louisiana, California, Texas or Mexico, the water problem is one of the problems which the producer must deal with.

In the accompanying article which Mr. Ragsdale, a staff writer of The OIL WEEKLY, has compiled, will be found a discussion which should prove of value to all producers.—The Editor.

REDUCING the water content of oil emulsions and thus saving for industry a great amount of fuel and lubricating oil has been a problem which has worried producers in Texas, Louisiana and California no little. The effort to get hold of a successful method of dehydration began in earnest several years ago but became more extensive when saving oil became as necessary in the winning of a great war as saving food and pennies. The war over, oil has risen to such heights that producers can afford to go to considerable expense in order to gain an extra barrel of their product.

Producers are concerned by a high water content in oil because pipe line companies refuse to accept oil that has more than 2 per cent water. Pipe lines cannot accept oil with a greater water content than this for two reasons. The water content is, of course, of no value and a company accepting oil with a high percentage of water is accepting an inferior product—paying for something (the water content) which is an absolute loss. Also there is danger of running oil containing too much water through a refinery. It vaporizes more rapidly than oils containing little or no water and leaves trouble in its wake as it goes through the refinery.

Water in oil has injurious effects, whether the oil is to be used as fuel or a lubricant. Irving C. Allen and Walter Jacobs in a bulletin issued by the United States Bureau of Mines says: "Water in a lubricating oil sometimes forms emulsions that tend to lower the durability of the oil and make it less efficient as a lubricant. In fuel oils the unfavorable effect of water is even greater. A fuel oil containing considerable water when burned under a steam boiler gives an unsteady flame that tends to go out. Water, being noncombustible, reduces the heating value of an oil in direct ratio to the percentage present, and converted into steam increases the inert and valueless gases within the firebox, reducing the heating effect of the combustible gases that should normally occupy the firebox space.

"A fuel oil containing water when burned in an internal-combustion engine will be even more unsatisfactory. A drop of water may prevent ignition of the fuel, and a number of such failures of the fuel to ignite would stop the engine."

This excerpt describes the effect of even a slight amount of water in oil. In certain fields, notably in the Gulf Coastal section, the production of crude has a heavy percentage of water and pipe lines would not accept the roily oil; it was almost worthless. This fact has caused operators considerable worry. How could the water content be reduced or be gotten rid of?

Four methods of dehydrating has come into use since the search for effective dehydration of oil emulsions was started. They are: (1) Steaming or boiling; (2) Electrical; (3) Chemical and (4) Centrifugal. Each of the methods will be discussed in more or less detail.

Dehydration By Boiling

Possibly the most costly and the most wasteful method of ridding oil of water is by boiling or steaming. Unfortunately it still is the most prevalent method. In former years this method was practiced almost exclusively, chiefly because it is the most simple—the one first thought of. A child even without the knowledge of physics would hit upon the plan of heating oil and settling off the water content.

One company on the Gulf Coast uses 600-barrel tanks for boiling the oil. The emulsion is run into the tank where it is heated by means of steam coils. The temperature to which the emulsion must be heated depends to some extent upon the character of the emulsion and varies from 160 degrees to 400 degrees Fahrenheit.

"Back in the days" when oil was $1 or less per barrel the cost of the boiling process was not so marked. It took considerable fuel to heat the steam pipes and keep them hot, but with oil worth less than $1 a barrel, the price was considered not prohibitive.

But the cost of fuel is not the only cost to be computed. The loss by evaporation must be considered. Whenever heavy oil is heated to a temperature as high as it required to get rid of the water content some oil is volatilized and lost.

The lighter vapors contained in the oil, these possibly of the highest value, are driven off by the heating process and are completely wasted and lost. There is no way of computing the cost because of this waste, as there is no way of telling what vapors are driven off and in what quantity.

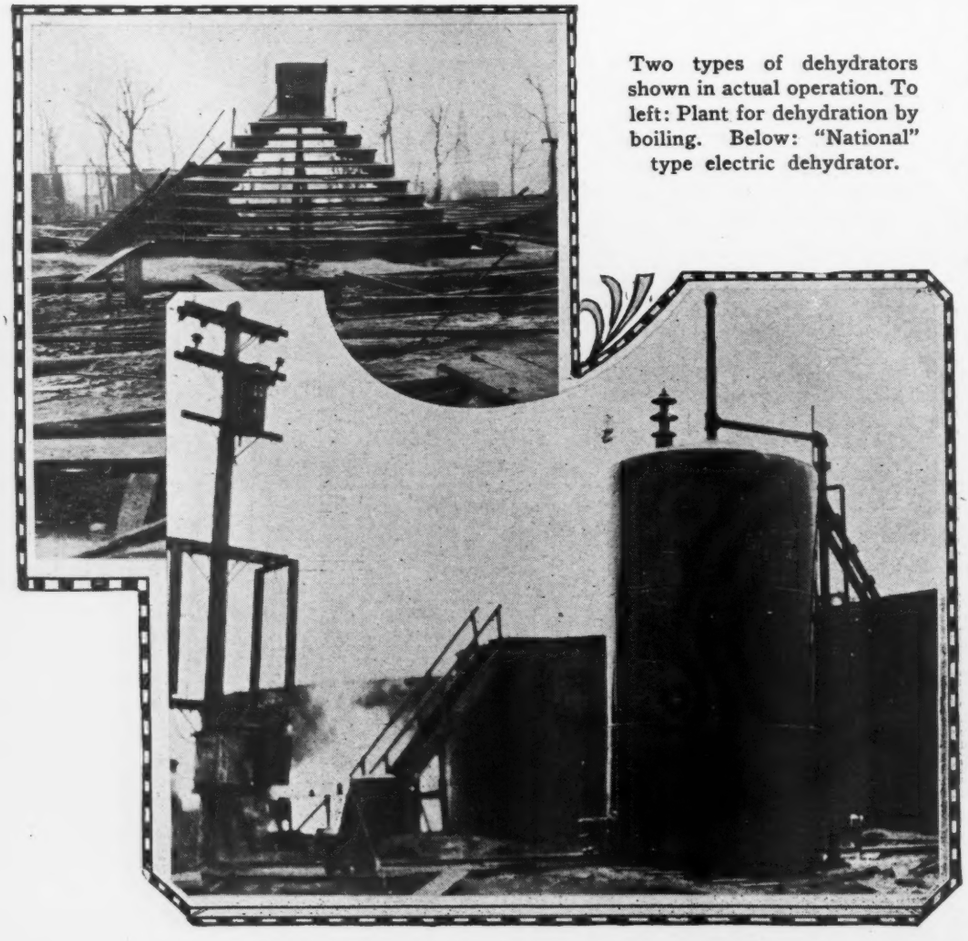
The Humble Oil & Refining Company estimated its cost of boiling or heating for dehydration at 8 cents per barrel. This was several years ago when oil was worth only one-third of what it is now. It is safe to estimate that the present day cost would run nearer 20 cents per barrel. Several companies which employ this method have estimated their cost between 15 and 20 cents per barrel.

But all that is said of the heating or boiling method must not be derisive. The method is being used at this time in certain coastal fields where other means of dehydration have been found more or less unsatisfactory.

Each Crude Is Peculiar

Each field's product has certain peculiarities and characteristics which must be thoroughly studied and experimented with by one seeking the best method of dehydration.

In some fields the chemical process of getting rid of the water content of oil is highly



Two types of dehydrators shown in actual operation. To left: Plant for dehydration by boiling. Below: "National" type electric dehydrator.

WHY BOIL YOUR OIL?

With oil worth $3.00 per barrel, if you treat your crude with the old steaming process you are wasting what otherwise would mean real income to you. To operate one steam plant a day means a cost of $100.00 a day for fuel for every 1000 barrels dehydrated.

Why burn this oil when it can all be saved?

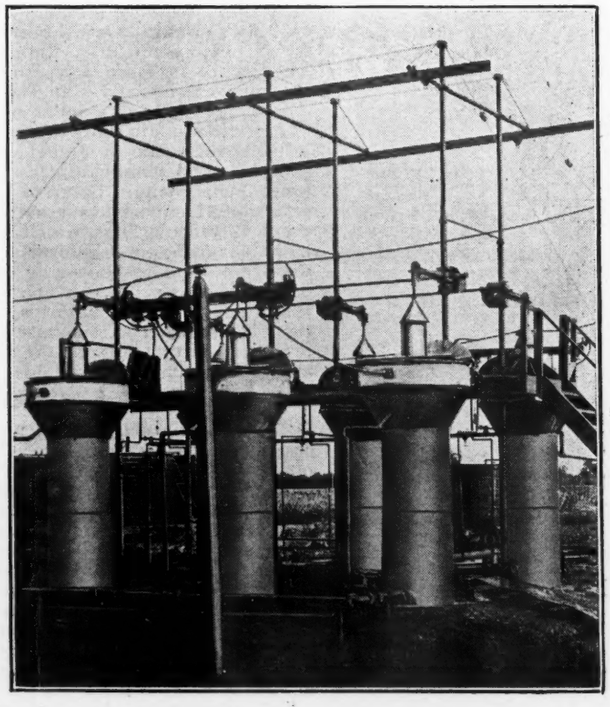
In addition to this fuel loss, you are incurring a substantial loss through the evaporation of the more valuable content of your crude, and a net loss of from 5 to 10 per cent in the volume of the crude treated.

Here is the case

BOILING SYSTEM
(Dehydrating 1000 barrels of oil)
COST—Fuel, loss in crude volume, labor, maintenance and repairs, fixed charges on plant, boilers, etc...**$275.00**

VS.

ELECTRICAL SYSTEM
(Dehydrating 1000 barrels of oil)
TOTAL COST—Including cost of operation, labor, maintenance and repairs, fixed charges and royalty paid us **$25.00**



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4 A continuous operation, practically automatic and requiring very little attention.

Inspection and reports made on any oil. All inquiries relating to business in Texas, Louisiana and Oklahoma, should be addressed to the Houston office.

Petroleum Rectifying Co.

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successful and is being used almost exclusively. In other fields this process is found less satisfactory, for example, than the electrical or the centrifugal methods.

II. Electrical Method

The electrical process of dehydration of emulsified oils involves the passage of the oil, as it comes from the wells, between two electrodes separated at a distance, which is governed by the water contents in the oil. The electrodes are connected to a source of electricity of sufficiently high potential to create an electrostatic field, or field of electric strain, which will cause the minute globules of water to conglomerate and coalesce until they become so large and heavy that they will settle out from the oil by gravity. The electricity in passing through the oil does not heat it to any appreciable degree.

According to S. T. Carr, Southwestern Representative of the Petroleum Rectifying Company of San Francisco, California, there are two types of electric dehydrators in general use, the National and the Cottrell. The basic patents covering both of these methods of electric dehydration of crude oil emulsions are owned by this company, the use of which is allowed oil producers by executing a license agreement with the company.

The National type (figure 1) is described by Mr. Carr as follows: "The treater consists of a sealed tank, 8 feet in diameter by 15 feet high with vertical plates termed 'polarizers' serving as electrodes, each alternate plate being grounded to the tank. The oil to be treated enters the lower portion of the tank through the inlet pipe and passes up through the electrodes, the cleaned oil being drawn off the top to the shipping tanks, and the water settling to the bottom and passing out through the goose neck water bleeder. The tank is at all times during its operation kept full of oil.

"In the Cottrell type (Fig. 2.) each unit consists of a galvanized metal tank, approximately 3 feet in diameter at the base and 10 feet, 7 inches in overall height, the shell of the tank forming one electrode and circular discs mounted on a vertical shaft, slowly revolved through suitable gearing by an electric motor, forming the other electrode. The oil emulsion is fed into each unit or treater at the top and passes down through each treater where it is drawn off the bottom and led to a trap or separating tank where the water is allowed to settle and bled off the bottom, the dry oil being drawn off the top of the separating tank through an adjustable swing pipe.

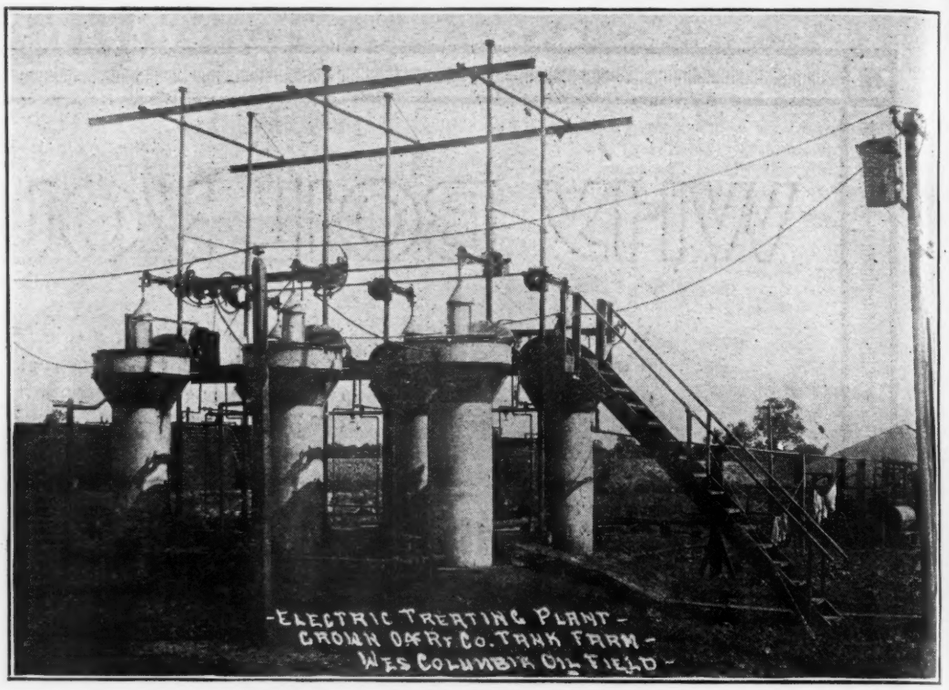

FIG. 2. SIX UNIT COTTRELL TYPE ELECTRIC TREATING PLANT, CROWN OIL & REFINING COMPANY, WEST COLUMBIA FIELD

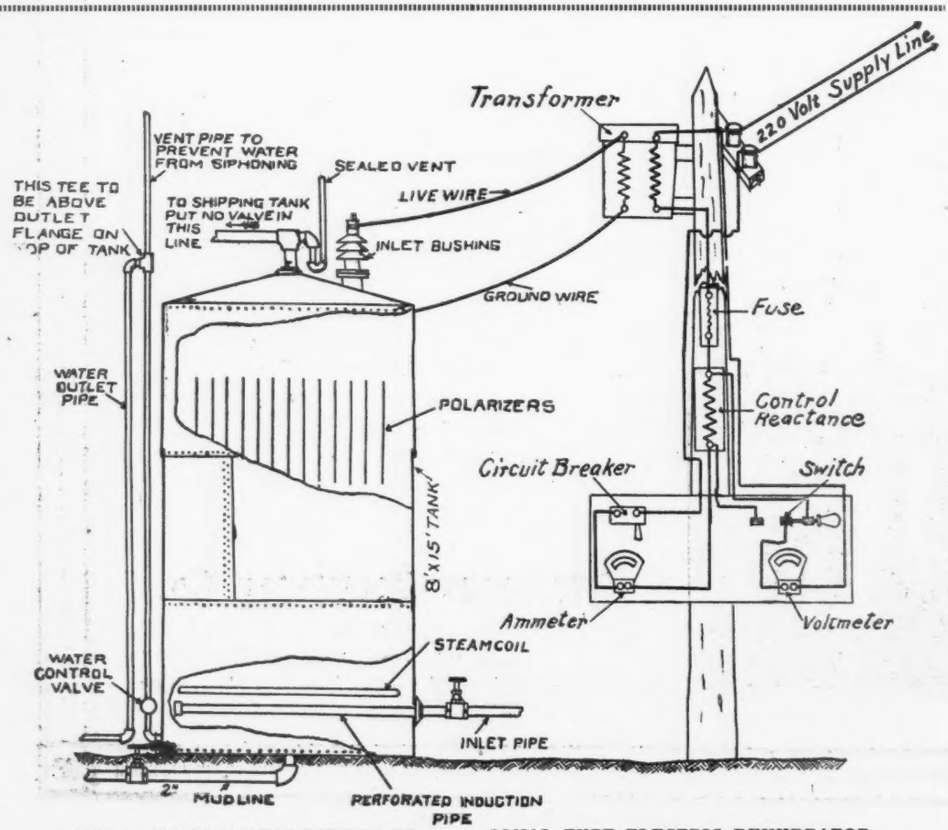

FIG. 1. DIAGRAMATIC SKETCH OF NATIONAL TYPE ELECTRIC DEHYDRATOR

"Although the Cottrell plant has revolving electrodes and is somewhat different than the National in mechanical construction, yet in theory the two types are alike. It has been found, however, that in treating certain kinds of emulsion, the revolving electrode is essential in preventing continuous short circuits.

First Electric Separator In 1911

"In 1911 the first electric dehydrator was put into operation in the California fields. At that time the only method known and used by the operators was the treatment by the steam heating process. This system was unsatisfactory in more ways than one, but the principal objection was the high cost of producing the required amount of steam and the evaporation loss in light vapors. In many cases in using the steam process it was found necessary to use a temperature as high as 400 degrees Fahrenheit in order to break down the emulsions found in low gravity oils of 14 degrees Beaume or less which are produced in large quantities in California. Owing to the greater economies shown by the electric process, it has steadily replaced the old steam treating system in California to such an extent that today it is recognized by the leading producers of that state as the most economical and practical method available.

Successful East of Rockies, Too

"The electric dehydration process was successfully introduced into the Gulf Coastal fields of Texas about one and a half years ago, and plants are now in operation or in course of construction in the Goose Creek, West Columbia, Hull, Humble and Saratoga fields. A great saving has been made by the oil companies in these fields by the adoption of this process and in many cases, two boilers formerly required to treat a certain amount of oil have been eliminated by the installation of one electrical unit. This saving has been particularly pronounced recently due to the high market value of fuel oil.

"In substituting the electrical process for the steam heating, a saving of six to ten cents per barrel of cleaned oil has been shown in the actual cost of dehydration.

"The electric power consumption per treater is remarkably low, varying from six to fifteen kilowatt hours per 24 hours. This con-

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sumption represents an average cost of about forty cents per day, based on the prevailing rate in the Gulf Coastal fields of four cents per kilowatt hour.

"The treater capacity in net oil dehydrated varies considerably upon the character of the emulsion to be treated, but a fair average of 1500 barrels per 24 hours can be placed on the National plant and 2500 barrels per 24 hours on a six-unit Cottrell.

"It has been found that the percentage of water and emulsion in the oil is not the determining factor in the capacity of the treater as in numerous cases oil containing as high as 85 per cent water and emulsion is being reduced with comparative ease to a water content of less than half of one per cent.

"One of the main features of the electric system is its simplicity of operation. It is practically fool-proof, does not require an expert attendant and is continuous in its operation."

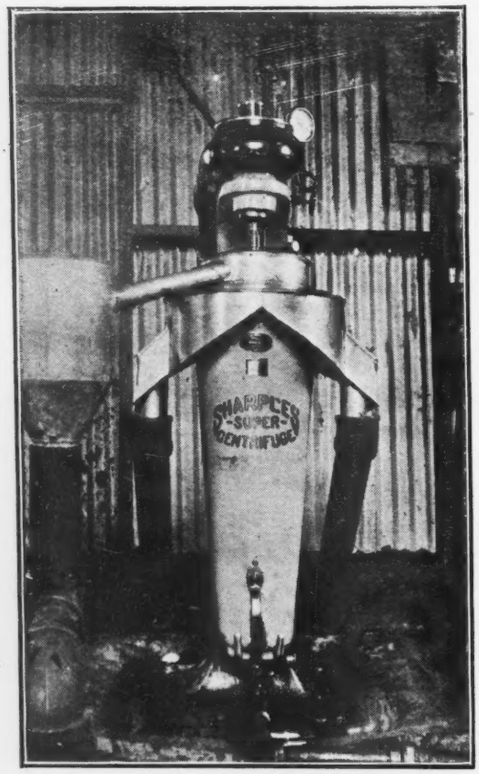
III. Chemical Method

Removing b. s. by a chemical, without the use of equipment other than that already used on every oil lease is the idea conceived by William S. Barnickel, a chemist of St. Louis. Mr. Barnickel has put his idea into operation in various fields and with notable success, especially in West Columbia, Texas.

In 1907 Mr. Barnickel happened to be in the Glenn Pool near Kiefer, Oklahoma. There he was attracted by the many fires throughout the field from which dense volumes of black smoke arose. He asked the cause of these fires and was told that b. s. or waste oil was being burned.

At that time b. s. was regarded as a nuisance. Oil producers would recover what good oil they could from this waste either by steaming it or suntreating and would run the residue into streams and creeks or burn it. Such were the fires seen by Mr. Barnickel when he visited in Oklahoma.

"In anything that will burn and produce such black smoke" he is reported as saying, "there are heat units, and anything containing sufficient heat units is of economical value and might be converted into a commercial product."



SINGLE CENTRIFUGAL MACHINE INSTALLATION, PEMETA, OKLA.

And he got a man's-sized job working on his idea. For several years he worked in his laboratory on a process which would treat b. s. and other roily oil and result in the recovery of the serviceable oil from the emulsions. After experimenting in his laboratory he went to the fields where roily oil was being produced. At Caddo, Louisiana, he treated thousands of barrels of roily oil and b. s. and brought the fluid up to the point where it would be accepted by pipe line companies.

Later he worked in the fields of Texas, Oklahoma and Kansas. The success of his process, while not phenomenal, was enough to bring it to the attention of several of the larger companies.

During the war when every means was being used to add to the supply of fuel, it was seen that the recovery of petroleum from b. s. would aid considerably. A company was thus formed to operate under the Barnickel patents so that every oil producer would be able to utilize the process, which consisted of chemical treatment of oil emulsions by the use of water-softening agents.

No extra equipment is needed by a producer who adopts Mr. Barnickel's process. The chemical which is shipped in fifty-gallon drums is mixed with the oil either at the pump or in the pipe line.

Different oil emulsions require a different chemical mixture, the change being made at the laboratory after a sample of the emulsion has been sent. It took Mr. Barnickel years to ascertain what chemical change was necessary in order to meet the dehydrating requirements of the different emulsions.

The Tret-O-Lite process has been especially successful in removing emulsions from West Columbia oil, both The Texas Company and the Humble Oil & Refining Company using it extensively.

The cost of dehydrating by this method is exceedingly low in that particular section. Frank Sterling, vice president of the Humble Oil & Refining Company estimates that the cost does not exceed one and one-half cents a barrel. More than 15,000 barrels of oil a day has been dehydrated at West Columbia by means of the Tret-O-Lite process. It has been found that "old" or "tank" oil yields as readily to the corrective properties of the chemical as that oil which is fresh out of the well.

Very little of the chemical is required in the treatment of the emulsions; so the freight cost of the full drums from St. Louis is not prohibitive. A barrel of the chemical is sufficient to treat between 10,000 and 15,000 barrels of the West Columbian emulsion. As stated heretofore no extra equipment is required, the chemical being fed into the pump which picks up the oil to be treated.

IV. Centrifugal Dehydration

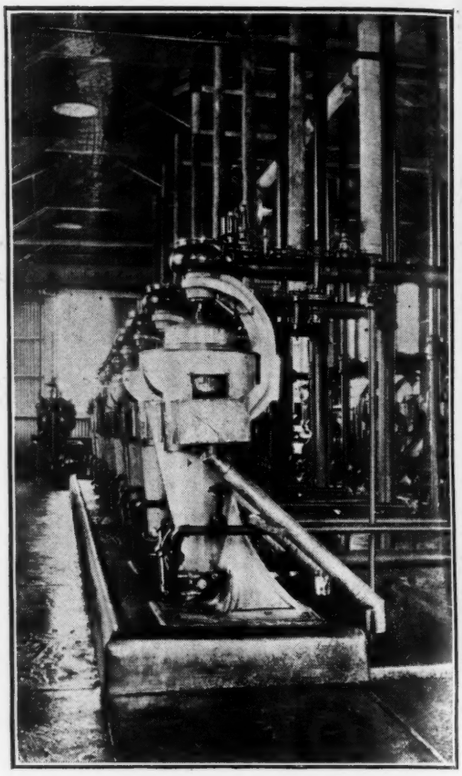
During the last two years the Sharples Specialty Company and the De Laval Separator Company have established numerous plants applying their process for the dehydration of field oil and their process for the recovery of pipe line oil from accumulated b. s. emulsions through the Mid-Continent field.

R. M. Gotham, centrifugal engineer, connected with the Sharples Specialty Company's office at Tulsa, Okla., has described the centrifugal process for benefit of readers of The OIL WEEKLY.

"Briefly, the integral part of this process is the super-centrifuge in which the emulsion is separated into its component parts of oil and water and these two liquids are discharged separately from each other," he said.

"Another essential part, however, of the installation is the proper arrangement of the accessory heating tanks and coils so that the emulsions may be put in the proper condition before centrifugal treatment.

"The various pipe line companies who have accumulated large quantities of tank bottom emulsions at their tank farms are now cleaning up these accumulations through the installation of two to five centrifugal units in connection with a portable plant. This plant



SCENE IN PLANT OF GULF PIPE LINE COMPANY, CADDO LAKE, LA.

can be erected very quickly and moved to a new point where it can be set up in a few days' time to treat another accumulation of tank bottoms.

"There are now nearly two hundred of these centrifugal units in actual operation in the Mid-Continent fields. The Prairie Oil & Gas Company has several million barrels of tank bottom accumulations on their various tank farms which they are working over into marketable oil with wonderful success. They own fifty machines and have plants ranging in size from five to twenty units.

"The most noteworthy achievement in this line to which this company points with pride is the latest plant put into operation recently at Cushing, Okla. There a twenty unit is turning out an average of 2000 barrels of reclaimed oil daily. The recovery of good oil from the original stock approximates on the average 70 per cent. The residue discharged from the machines consists of 95 per cent water.

"Many other companies own large plants, among which are the Empire Pipe Line Company and the Empire Gas & Fuel Company, the Gulf Pipe Line Company, the Standard Oil Company, the Gilliland Oil Company, the Magnolia Petroleum Company, Cosden & Company, and the Sinclair Company.

"A large number of small independent producers have found it to their advantage to work over accumulations of various sizes, as in this day of high prices for oil it is good business policy to reclaim everything possible. It has been found that one of two unit plants will often pay for themselves within as short a time as a single month.

"The Sharples Specialty Company has spent more than $50,000 in research and development work in order to obtain the necessary information so that this process can be applied to any of the various types of oil which occur in the Mid-Continent field, and they have on their staff several field engineers who have been in close touch with the development of this process since the work was first started and who are in a position to apply their knowledge of the application of this process to meet any new and special requirements."

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Big Four Produce Almost Half of Texas Oil

ALMOST half of the oil produced in Texas during the year ending June 30, 1920, was produced by four companies. The big four, both in production and valuation of oil reported are The Texas Company, the Gulf Production Company, the Humble Oil & Refining Company, and the Magnolia Petroleum Company. Their combined production for the four quarters designated amounted to 35,230,007 barrels, valued at $81,411,730. The grand total for the almost 800 companies which reported was 76,453,348 barrels, with a fixed valuation of $184,296,447.

These figures, as shown in the accompanying tables, reveal the fact that 46.1 per cent of the production in Texas during the year—July 1, 1919-June 30, 1920—is credited to the four companies mentioned. Their combined valuation figures are 44.2 per cent of the total valuation reported.

Sixteen other companies are carried in the tables. Fifteen of these produced more than half a million barrels of oil during the four quarters. The one exception, the Lone Star Oil Company, is listed at 498,399 barrels. Each of the sixteen, again with one exception, the Livingston Oil Corporation, gave valuations in excess of $1,000,000 for the four quarters.

The twenty companies shown produced a grand total of 53,276,619 barrels of oil, or 69.6 per cent of the production of the entire state (76,453,348 barrels). The valuations given by the twenty companies total $125,169,467, which is 67.9 per cent of the $184,296,447 total listed for the almost 800 companies.

Valuation of the year's production by quarters shows a steady increase. The first quarter listed, that period ending September 30, 1919, the valuation was $38,259,535. By the end of the subsequent quarter the grand total valuation figure had increased to $40,356,818. More than a $3,000,000 gain was recorded by the end of the quarter ending March 31, 1920, when valuations aggregated $43,635,059 and an immense jump came with the report issued during August, which shows the valuation for the period of April 1-June 30, this year, as being $62,045,035.

This increase was listed despite the fact that the production for the last quarter under discussion is second lowest of the four given in the table. Production figures for the four quarters are as follows:

Production by Quarters of the Oil Companies in the State of Texas as Reported to the State Comptroller for the Year Ending June 30, 1920—Barrels of 42 Gallons

		1919		1920		
Rank	COMPANY	Quarter Ending Sept. 30	Quarter Ending Dec. 31	Quarter Ending March 31	Quarter Ending June 30	Total for Year
1	The Texas Co.	2,972,646	2,951,485	2,655 332	2,979,489	11,558,952
2.	Gulf Prod. Co.	2,867,245	2,478,169	2,214,306	2,118,909	9,678,629
3	Humble O. & R. Co.	2,330,613	1,835,971	1,908,672	1,888,521	7,963,777
4	Magnolia Pet. Co....	1,812,776	1,610,649	1,309,563	1,295,661	6,028,649
5	T. & P. O. & G. Co..	980,495	782,810	529,348	531,437	2,8 4,090
6	Prairie O. & G. Co..	630,987	623,651	527,876	313,136	2,095,650
7	Sun Company	629,461	451,492	423,214	510,591	2,014,758
8	Mid-Kan. O. & G. Co.	531,668	501,700	288,926	245,264	1,567,558
9	Sinclair O. & G. Co..	70,785	441,942	433,276	595,648	1,541,651
10	E. F. Simms & Co....	233,748	231,940	289,266	309,026	1,063,980
11	Republic Prod. Co....	204,377	366,770	250,835	194,486	1,016,468
12	Crown O. & R. Co...	461,798	132,714	109,472	156,352	860,336
13	Texhoma O. & R. Co.	128,753	117,088	213,973	303,165	762,979
14	Gilliland Oil Co.....	308,280	179,574	133,904	116,548	738,306
15	McMann O. & G. Co.	208,550	255,737	125,273	80,9 9	670,489
16	States Oil Corp.	47,620	149,038	179,968	278,382	655,008
17	Panhandle Oil Co....	205,482	125,979	177,373	133,315	642,149
18	Livingston Oil Corp..		399,063	87,266	105,144	591,473
19	Kansas Gulf Co.....			178,779	324,539	503,318
20	Lone Star Oil Co....	140,739	110,997	137,279	109,384	498,399
	Total, 20 Co.'s.....	14,766,023	13,746,769	12,173,901	12,589,926	53,276,619
	Total, all other Co.'s.....	4,209,264	6,880,955	6,128,844	5,957,666	23,176,729
	Grand total, all Co.'s.....	18,975,287	20,627,724	18,302,745	18,547,572	76,453,348

Production Value by Quarters of the Oil Companies Operating in the State of Texas as Reported to the State Comptroller for the Year Ending June 30, 1920

		1919		1920		
Rank	COMPANY	Quarter Ending Sept. 30	Quarter Ending Dec. 31	Quarter Ending March 31	Quarter Ending June 30	Total for Year
1	The Texas Co.	$5,457,747	$5,489,504	$7,216,276	$9,786,128	$27,949,655
2	Gulf Production Co...	4,491,755	4,415,308	5,596,369	6,837,925	21,341,357
3	Magnolia Pet. Co....	4,036,171	3,800,756	4,068,958	4,474,721	16,380,606
4	Humble O. & R. Co.	3,037,970	2,651,884	4,355,035	5,715,223	15,740,112
5	T. & P. O. & G. Co..	2,207,083	1,878,689	1,664,869	1,860,049	7,610,690
6	Prairie O. & G. Co..	1,419 518	1,502,677	1,631,042	1,095,978	5,649,215
7	Sun Company	1,220,561	662,533	1,066,042	1,673,395	4,622,531
8	Mid-Kan. O. & G. Co.	1,196,254	1,175,010	914,046	858,426	4,143,736
9	Sinclair O. & G. Co..	63,707	947,920	1,205,323	1,213,110	3,430,060
10	Texhoma O. & R. Co.	289,695	255,250	697,502	1,096,077	2,338,524
11	States Oil Corp.	107,145	357,041	581,311	974,337	2,019,834
12	Gilliland Oil Co.....	693,621	398,896	423,549	407,604	1,923,670
13	Panhandle Oil Co. ..	464,943	306,195	549,514	469,440	1,790,092
14	Kansas Gulf Co.			570,523	1,195,068	1,765,591
15	Republic Prod. Co. ..	238,879	424,036	512,275	589,644	1,764 834
16	E. F. Simms & Co...	233,748	255,830	582,582	613,283	1,685,443
17	McMann O. & G. Co.	471,265	605,376	286,664	300,125	1,633,430
18	Crown O. & R. Co. ..	346,348	143,321	220,039	459,676	1,169,384
19	Lone Star Oil Co. ...	316,664	262,796	430,577	382,844	1,392,881
20	Livingston Oil Corp..		275,136	233,001	279,685	787,822
	Total, 20 Co.'s	$26,293,074	$25,808,158	$32,785,497	$40,282,738	$125,169,467
	Total, all other Co.'s	11,966,461	14,548,660	10,849,562	21,762,297	59,126,980
	Grand total, all Co.'s.....	$38,259,535	$40,356,818	$43,635,059	$62,045,035	$184,296,447

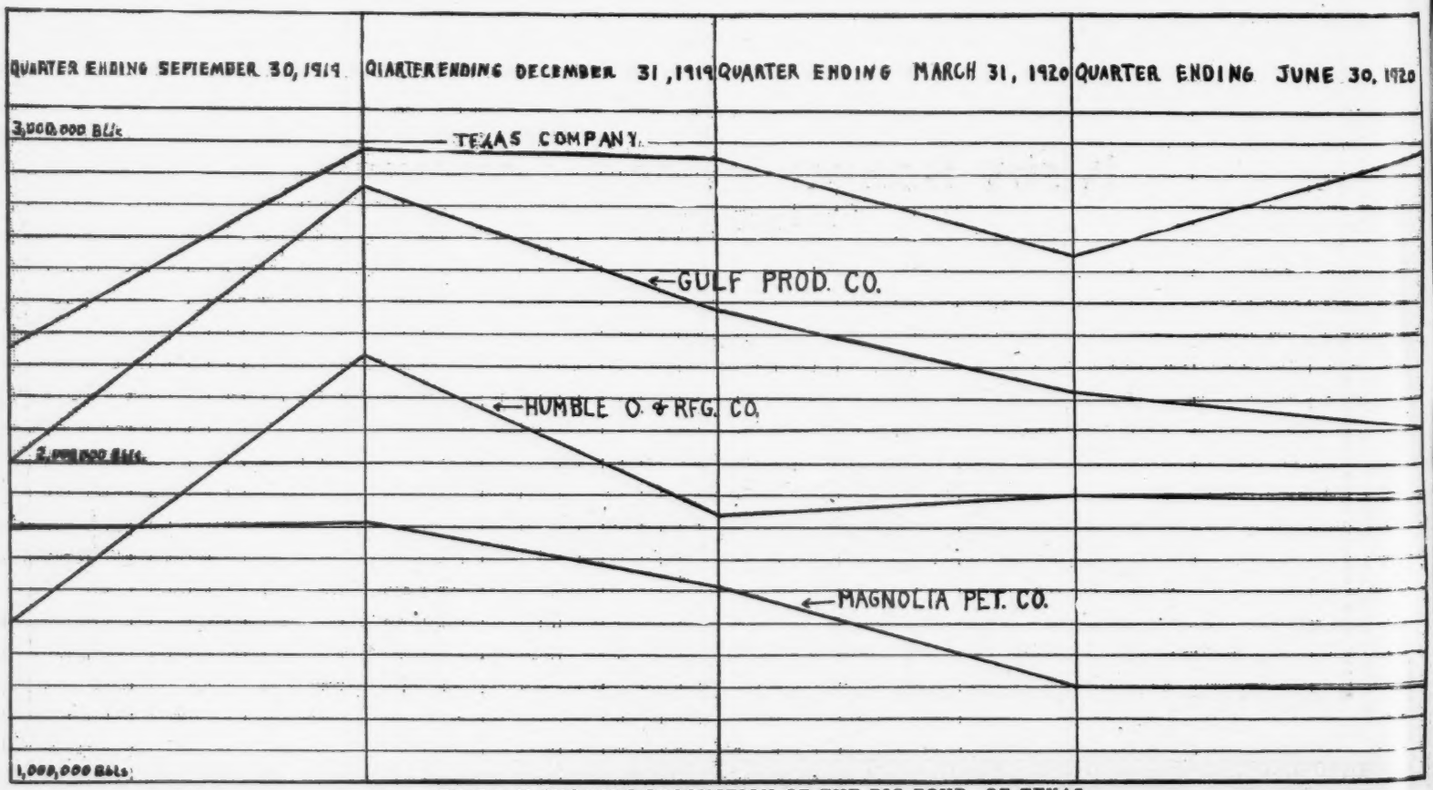
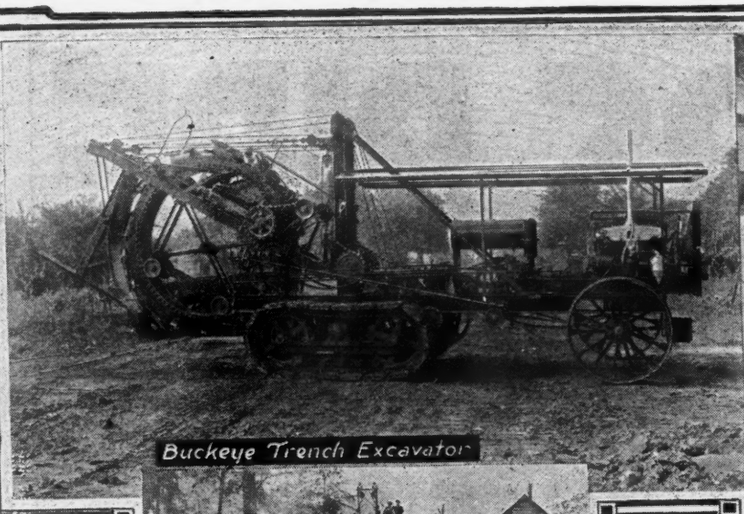


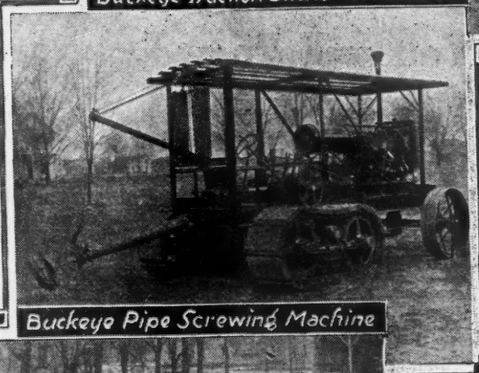
DIAGRAM SHOWING PRODUCTION OF THE BIG FOUR OF TEXAS



Buckeye Trench Excavator

Working Side by Side.

Buckeye Traction Ditcher in Action



Buckeye Pipe Screwing Machine

Buckeye Pipe Screwing Machine in Action

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Gentlemen: Thinking that the following data, which was given by our machine operator, would be of interest to you, we quote the following:

8400 feet of 16x30 inch ditch in 24 hours.
Character of soil: gumbo.
Topography of country: gently rolling.
Soil: not too wet or too dry.
A smooth ditch and a neat, even pile of excavation.
On the whole a rapid, smooth, workmanlike ditch.
Favorable comment by inspection engineers.
On the whole entirely satisfactory.

Yours very truly,
JOSEPH ARDIZZONE.

Put Your Labor Troubles Behind You
Write for more detailed information

Buckeye Traction Ditcher Co.

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"Less Grief
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SCENE SHOWING RUSSIA'S OLDEST OIL FIELD, BIBI EIBAT, WHICH LIES ON OUTSKIRTS OF CITY OF BAKU, NEAR CASPIAN SEA

Russia, Land of Oil Possibilities

Finding of oil dates back centuries before Christ; production now low because of Bolshevism

By A. Beeby Thompson

FOR more than 2500 years, natural gas issues in the Surakhany district of the Apsheron peninsula were the object of pilgrimages by fire worshippers and Hindoos from Burma and India. Even as late as 1890, Hindoo priests conducted ceremonies in a temple at Surakhany, which probably replaced a more ancient one; but later, the visits of the pilgrims were prohibited in order to check the spread of Asiatic diseases in that region.

For centuries, limited supplies of oil have been abstracted from shallow excavations in the Caspian oil belt and dispatched into the interior of Asia and elsewhere for medicinal and industrial purposes. Statistics show a yield of 37,400 barrels in 1863, but only since 1869 has there been serious development; in that year the yield was 203,000 barrels. At that time, hand digging was supplanted by drilling, and the enormous wells that resulted from tapping sources hitherto beyond the reach of operators completely demoralized the industry for a time, owing to inadequate outlets for the products.

The early activities in this area were greatly hindered by annoying taxation, monopolies, imperial land grants, etc., but when these were revoked or adjusted, in 1877, the industry sprang into prominence and, between 1898 and 1901, the Baku fields produced practically one-half of the world's supply of oil.

Within a few miles of Baku lie the two richest oil fields in the world; viz., the Balakhany-Saboontchy-Romany and the Bibi-Eibat, the latter constituting almost a suburb of the city. For many years the gasoline obtained in the refineries of the Baku area was burned in pits, being considered an undesirable product, and until 1870 the residue also was destroyed, its value as a fuel not being recognized. Kerosene was the main product sought by the refiners. It was shipped across the Caspian Sea and up the Volga to the industrial centers of Russia. Only on the completion of the Baku-Batoum railway did the Baku oil fields secure important commercial communication with the outside world through the medium of the Black Sea. The first tank steamer was successfully launched on the Caspian in 1879, by Messrs. Nobles, for transporting oil in bulk instead of in barrels. In 1905, an 8-inch pipe line to Batoum was opened; this was capable of transporting to seaboard 8,000,000 barrels of kerosene per annum.

In 1903, the important Gronzy oil field was proved by a great flowing well sunk by an enterprising Englishman, who, however, was ruined by the claims for compensation made by peasants whose habitations and lands were destroyed by the deluge of oil, which could not be controlled for years. The property on which the well was drilled has since given 300,000 barrels of oil per acre.

In 1901, general interest was directed to the Binagadi oil field by the bringing in of a 10,000 barrel well. The field lies close to Baladjari railway station and only a few miles from Baku and the refineries, to which a pipe line was subsequently laid. In this year, also, an important oil field was located at Berekei; but after a few years' work hot sulfurous waters flooded the oil sands and, as no suitable means for its exclusion were devised, the field was practically abandoned, although some wells continued to yield for years. Berekei lies on the Caucasian railway near the port of Derbent. The oil from the field was piped to the railway and taken in tank wagons to its destination.

Another interesting field is Holy Island, off the north coast of the Apsheron peninsula; 400 barrel wells have been struck and a considerable area has been proved to be oil-bearing. Oil is shipped direct to the Volga by tanker proceeding from Baku. In 1908, the Surakhany district a few miles southeast of the main Saboontchy oil field was developed by deep wells, and large gushers of the typical Baku oil resulted from drilling beneath the upper light oil and gas-yielding beds that until then had been exclusively worked.

For many years the island of Cheleken, off the Asiatic coast of the Caspian Sea, near Krasnovodsk, had been the scene of some moderate operations; but from 1911 onwards large yields were obtained from wells sunk in the Ali Tepe district in the southwestern part. These wax-containing oils were generally

shipped to Baku for treatment at Blacktown, the refinery suburb of Baku.

In 1909, the Maikop oil field attracted considerable attention as the result of a large gusher of light oil being struck by almost the first trial well in the Shirvansky district. Since that time, a fair production has been obtained although the very prolific area was proved to be small. This field lies on the northern flanks of the western, and sinking, end of the Caucasian range, over which a pipe line was laid to the port of Touapse. Pipe lines were also laid to Ekaterinodar, where a refinery was erected, as well as Shirvansky.

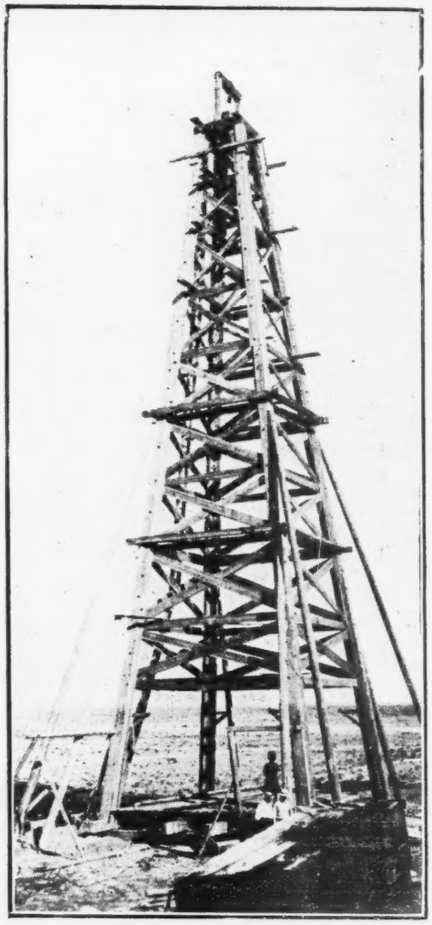
A promising oil field was developed, about 1910, in the Emba district north of the Caspian sea and inland from the port of Gurieff. Around Dossor, flowing wells were struck and, prior to the war, extensive arrangements were being made to dispose of the product. Pipe lines were laid to Bolshaya Rakashka, where refinery operations were conducted, and submarine pipe lines were carried through the shallow-water belt to facilitate shipment of the products up the Volga.

A single Turkestan field, in Fergana on the Trans-Caspian Railway at Chimiono, has yielded substantial supplies of oil that finds a ready local market. It is said that at Maili Sai good productions resulted from trial wells sunk by the government.

Leasing of Oil Lands

Many original grants of oil lands were gifts bestowed on court favorites, but when some system was introduced terms were based solely on the unique Baku conditions, and prospecting licenses of about 100 acres were granted from which 27 acres could be selected when oil had been found. The original annual rentals of $2 per acre for the first ten years, increasing ten times each ten years, were soon superseded by percentage royalties, which varied from 25 per cent upwards, with minimum annual payments. At one time tenders on a royalty basis were publicly solicited, but speculation led to such absurd offers that the government abandoned the practice. For instance, at times, operators tendered royalties of 75 per cent, with large minimum payments merely to protect their boundaries from aggressive competitors.

The Cossack lands of the Terek-Kuban provinces were subject to a rental of $5 per acre per annum and about 4 c. per bbl. royalty for the first 120,000 bbl. and 2 c. per bbl. afterwards; but rights were reserved to revise the royalties after 12 years. Insistence in perpetuating the old leasing laws based on the unique oil fields of Baku has been a great hindrance to prospecting in Russia, and it is to be hoped that some more rational policy will be introduced in the near future.



FIRST ROTARY DERRICK IN RUSSIA. POLES USED INSTEAD OF GUY ROPES

Disposal of Russian Oils

The products of the Baku oil fields go largely to supply the internal demands of Russia through the medium of the Caspian Sea and the River Volga, although the freezing of the northern Caspian and the Volga in the winter months restricts movements of oil to about eight months in the year. A pipe line and railway to Batoum are available for the conveyance of lamp oils and other oil products to the Black Sea, where ocean vessels can approach via the Dardanelles. The large refineries are situated at Blacktown, a suburb of Baku.

Oil from the Grozny field and refineries is either piped to the port of Petrovsk on the Caspian Sea or sent by rail to Novorossisk on the Black Sea. From Holy Island and Cheleken, oils are mainly sent to Baku for treatment; while the North-Caspian (Emba) oils are shipped at Bolshaya Rakashka for transmission up the Volga. Central Asian oils find a ready Asiatic market and are useful for the Trans-Caspian railway service. Maikop oils can either be pumped to Touapse on the Black Sea or to Ekaterinodar, a large town that feeds a wide, fertile agricultural region. Extensive tank farms are situated at Baku, Grosny, Batoum, and Novorossisk; also up the Volga, where the winter supplies are accumulated during the summer months.

Oil Manifestations

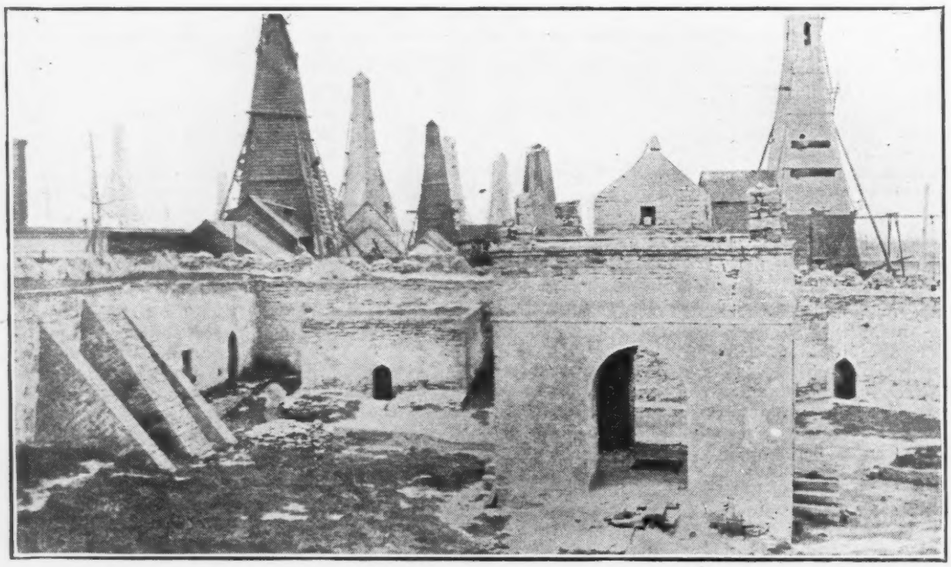
No country in the world probably exhibits a greater display of oil field surface phenomena than Russia. There are thousands of square miles flanking the Caucasus Mountains and encircling the Caspian Sea that justify an investigation. Difficulties of language, inaccessibility, danger to life, indifference of the authorities, and irritating restrictions to their mineral resources have contrived to suppress any initiative that existed. For miles around the Baku oil fields, the oil series lie spread out like the leaves of a book under the nearly desert-like surroundings of that devastated region. Mud volcanoes on a gigantic scale in every stage of activity may be witnessed, as well as perpetual fires fed by incessant issues of natural gas. Acres of asphaltic residues and streams of viscous oils oozing from immense thicknesses of oil-soaked sands are common. These phenomena, mingled with sulfurous waters, present problems for study that are nowhere else reproduced on such a large scale. Over extensive areas, shallow hand-dug wells sunk into the outcropping inclined or vertical strata yield appreciable, and often considerable, quantities of oil.

Many equally imposing exhibits of oil phenomena may be seen on Holy Island and Cheleken, where for miles numerous oil residues, gas exudations, and sulfurous and salt-water issues may be examined along the outcropping beds. Fierce outbursts of oil and gas occasionally startle the inhabitants, cause damage to property, and loss of life. Twice within the writer's knowledge, such outbursts in the Yasmal Valley have caused conflagrations that illuminated the sky for miles around each night. Big outflows of oil have also been recorded; and during earthquakes, considerable alarm has been occasioned by the ignition of gas that issued from cracks in the earth. Little less interesting are the great mud volcanoes of the Taman peninsula, which area has not received the attention its manifestations merit.

An interesting phenomenon is the submarine gas issues. Prior to the development of the Baku oil field, several places in the Caspian Sea were known where the ebullition caused by escaping gas was sufficient to capsize boats.

Geology

As is the case in many other oil fields, structure is the dominating feature of the chief oil fields of Russia. Comparatively simple partial domes characterize the two great fields of Baku, but both have flanks on one side where the oil-bearing series outcrop and display those surface phenomena usually associated with oil. The whole series of Tertiary strata in which the oil is secreted consists of unconsolidated clays, sandy clays, and sands of all grades of fineness that readily break down and crumble when pierced by the drill. Their fragile nature is the cause of unusual difficulties in drilling, as throughout a thickness of over 3000 feet



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Value Crude Produced in North Central Texas Fields in August

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—this is 77 per cent MORE than the value of the production fifteen months ago.

	MAY 1919	NOV. 1919	AUG. 1920
Daily Production	163,328	228,639	190,056
Price of Crude	$2.25	$2.25	$3.50
Value for Month	$11,392,128.00	$15,133,110.00	$20,621,076.00

NOTE: These statistics were compiled by our Research Department from sources that are considered reliable

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there are constant irregular and ill-defined alternations of sands and clays that merge into one another in a way that makes a log very unreliable when prepared from collected samples. Some sands are charged with oil, some with gas alone, and others with oil and gas. Many of the water-bearing quicksands run freely on penetration and fill the hole to a depth of hundreds of feet. At times, too, oil-saturated clays continue to ooze into the well, which renders progress very difficult.

Certain sandy horizons can occasionally be traced for some distance and definite water and oil horizons have been located within restricted areas. Generally, however, the pliable beds have been so contorted and crushed that no single bed can be recognized for any considerable distance. Geological study was always made more difficult by the further disruption the beds sustained when rich oil sands were struck. Masses of surrounding strata were expelled on penetrating a rich oil sand; in addition, thousands of tons of sand was either ejected with oil during flows or removed with the oil during its abstraction. As much as 50 per cent sand (by weight) has been suspended in the oil for a time, and often 10,000 tons of sand have been ejected daily, for some weeks, from a well piercing a virgin and prolific sand body.

Stratigraphy

The oil-bearing rocks of the Russian oil fields are of Miocene and, to a less extent, of Oligocene age; that is to say, occur in the deposits of the old Caspian-Mediterranean Sea that surrounded the Caucasus and generally lie unconformably upon the more highly disturbed Cretaceous beds. The large area covered by these deposits, particularly along the foot of the northeastern slopes of the mountains, has enabled very many occurrences of oil to be noticed. It is these Tertiary rocks alone that present any interest, although considerable quantities of gas have occurred in the Cretaceous, a noteworthy instance being during the construction of the tunnel on the Novorossisk line. Oil seepages are likewise known in the Cretaceous rocks.

Detailed geological study of this great area has not been attempted, in fact, published maps have been confined to the districts in which development has taken place. Tabular columns are appended of the Neftianaia-Shirvanka area in the Kuban, or northwest area; the Grozny, or northeast field; and the Apsheron Peninsula, the most eastern portion and seat of by far the most important development, the Baku fields. These tables show that the Miocene rocks present similar characteristics throughout the northern flanks of the mountains but that at Baku there is a distinct facies, which is largely concealed by the characteristic Pliocene and Post-Pliocene formations of the Caspian Sea. Nevertheless, the Apsheron Peninsula as a whole presents a very complete exposure of the succession, notably in its northwest corner and in the Yasmal Valley and adjacent hills farther south, while the Pliocene and younger rocks are seen around the fields and farther east. The Grozny field, forming as it does a very complete instance of a subsidiary fold, may well be referred to as a classic example of the asymmetrical anticline; it yields no exposures of the older rocks. Still farther westward, in the Kuban area, the development has been along the margin of the Tertiaries where they are creeping around the final Cretaceous anticlinorium of the Main Range before it disappears beneath nearly level younger formation in the Taman Peninsula to reappear under similar conditions in the Crimea.

The same formations occur south and southwest of Baku and are recognizable across the Caspian. It is impossible to draw any geological limit to the oil province of Southern Russia; it must be studied in the future as part of the Eurasian fields.

Structure

Regionally, the structure is that of folding parallel to the main ridge of the Caucasus with development of asymmetric folds along the northeast side, more disturbed conditions to the south, and gentle plunging of the Tertiaries and Pleistocene at the ends, with quite considerable local folding in the thick series of plastic rocks composing the earlier Tertiaries of these districts. Two well marked directions of folding northeast and northwest, of which the former is the older, are recognizable. The

Table 1.—Section of Apsheron Peninsula (after Golubiatnikov).

Stage		Formation	Thickness, Meters	Lithological Character
Post Pliocene	Upper	Coastal deposits of present Caspian extending to 10 m. above present sea-level.	5-10	Sands, clay, and shell fragments.
		Older Caspian deposits forming conglomerates at a height of 12 and 26 m. and reaching to a height of 34 m. above present sea-level.	14	Sands, clays, boulders and shell conglomerates.
		Aralo-Caspian Terraces at a height of 96 and 186.5 m. (beds not disturbed.)	3-6	Limestones, sands with boulders and conglomerates.
	Middle	Bakunian (disturbed).	46	Limestones, sandstones, sands, clays and conglomerates.
Pliocene		Apsheronian.	453	Limestones, boulder limestones, oolites, shell beds, sandy limestones, calcareous sandstones, sands, marls, sandy clays, and clays; limestones predominate in the upper beds, sands in the middle, and clays in the lower; the thick clay series (110 m.) contain layers of tufaceous sands at base.
	Lower	Pontian (?)	76	Dark colored clays interbedded with sand and marl; contain gas at Bibi-Eibat.
		Transition beds.	11.3	Dark clays with interbedded gas sands; sands gas bearing at Bibi-Eibat.
Miocene	Upper	Akchagylian.	49.4	Dark colored clay shales and shaley clays interbedded with limestones and white tufaceous sands; the sands are gas and oil containing in Bibi-Eibat.
		Fresh water formation.	490	Clays, sandy clays, sands with clay and sand; clays predominate.
	Middle?	Unfossiliferous series: First series, sand oil bearing at Bibi-Ebat.	434	Sandy clay series; sands predominate.
		Second series, sand oil bearing in Yasmal Valley.	185	Sands and sandstone with interbedded clays.
		Break in the series until the Spiralis beds at	98	
	Lower	Spiralis beds.		Siliceous, calcareous and sandy clay rocks with interbedded ferruginous sandstones; in places oil bearing.
		Cedroxylon beds.		Dark colored, laminated shales with concretions of siliceous sandy rocks.
Oligocene?		Amphisyle beds.		Shales, dark, and chocolate colored, weathering yellow.
		Lamna beds.		Green, sandy clay shales with interbedded siliceous sandy rocks and white marls; oil bearing in places.

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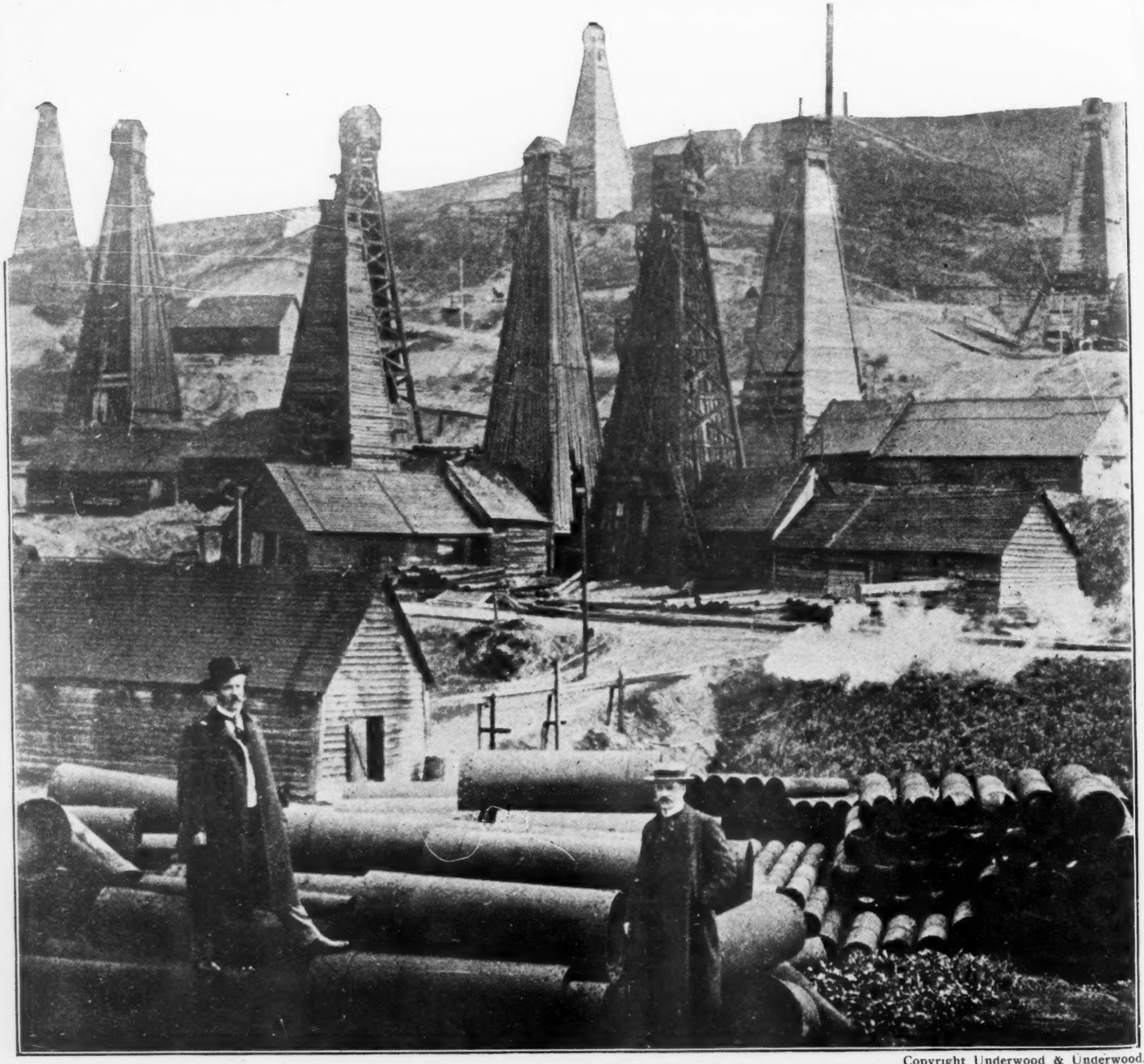
intersection of these two lines at the Taman and Apsheron Peninsulas leads to local development of great pressure, which, acting on the plastic material, gives rise to the phenomenon of "salses," or "mud volcanoes" as they are often called, in which the softer underlying strata are squeezed out in the form of mud, associated with much salt water and gas, the latter being composed of hydrocarbons and at times emitted on a grandiose scale. The exuded material forms considerable hills, at the top of which a crater shows activity, even in times of relative quiescence. The rather complex structures resulting from the intersection of these folds are often hidden beneath the Pleistocene rocks, which partake of no folding, and the Pliocene which have suffered slight deformation. This is especially the case in the Taman Peninsula. It is also the case, to a certain extent, in the Apsheron Peninsula though good exposures exist.

The Apsheron Peninsula is built up of Pleistocene and Tertiary rocks and both the Pliocene and the Miocene rocks are well developed. It is the Upper Miocene that carries the pay so far developed. The shell limestones of the Pliocene, which form the Baku building stone, are less easily denuded than the Miocene rocks and so form escarpments around the oil fields, usually bordering plateaus, while the Miocene rocks, where exposed, form gently undulating country.

The Akchagylian (Upper Miocene) contain abundant fish remains and thin beds of volcanic ash. The only known occurrence of pay in them is at Surakhany; it is of the filtered type and, therefore, secondary. The freshwater formation contains shell remains and algae. It covers large areas in the older fields but is concealed at Surakhany. The underlying unfossiliferous series forms with it the source of the bulk of the oil hitherto won in Russia.

The unconformable Lower Miocene, capped by the hard siliceous limestones with very characteristic casts of Spirialis hospes, Kitl., which forms a useful mapping horizon, are petroliferous; especially noticeable are the Oligocene fish shales, but these strata have yielded no pay.

Four directions of folding occur, northwest, meridional, latitudinal, and north-northeast. The first, that of the main Caucasian ridge, prevails at Bibi-Eibat, Holy Island, and over much of the northeast part of the peninsula; the second at Surakhany. Many folds are subject to change and complex structures ensue, in the formation of which faulting stands in close relation. Faults are usually of small throw and coincide with the axial crests, but three important lines must be noted as they dominate the Peninsular structure. The first is the circular uplift following the ridges Kabiriadig-Puta, Atashka-Shaban-Dagh, and Kobi-Bos-Dagh; this lies west of any important developed area. The second runs along Atashka-Shaban-Dagh, Gyokmabj-Khurdalan, and Binagady; and the third through Fatmagi-Dygia, Kir-Maku, Balakhany-Saboontchy-Ro-



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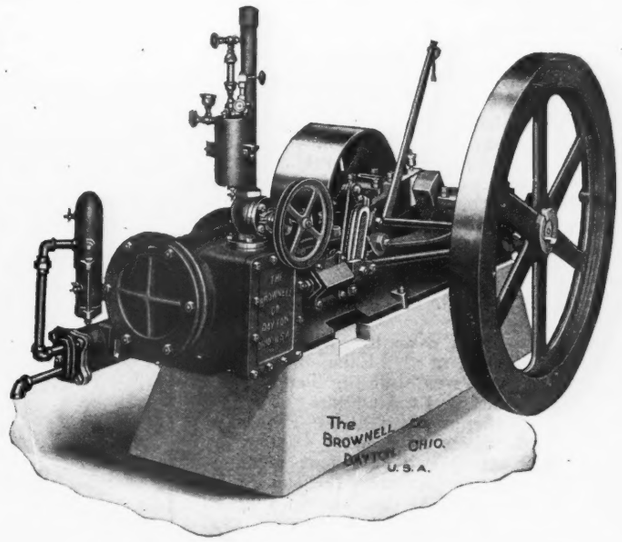

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many, and Surakhany-Zykh. These two lines form, with the Bibi-Eibat fold, a horseshoe line open to the sea; it is along this line that the big production has been obtained. The last important tectonic movements took place at the cose of the Upper Pliocene period, the next before was at the commencement of the Upper Pliocene, while between the Middle and the Lower Oligocene much greater dislocation took place.

Oil Occurrence

The following horizons are known to carry oil:

1. Middle Pliocene; lower Apsheronian at Surakhany and Romany.
2. Lower Pliocene; Pontian at Bibi-Eibat.
3. Akchagylian; at Bibi-Eibat, Surakhany, Romany.
4. Fresh-water beds: at Bibi-Eibat, Surakhany, Romany, Saboontchy.
5. Unfossiliferous; Puta, Atashka, Khurdalan, Binagady, Kir-Maku, Balakhany, Holy Island.
6. Lower Miocene: (Spirialis) Puta, Atashka, Kobi, Gyokmabj, Khurdalan, Binagady, Holy Island.
7. Amphisyle beds: Sumgait.
8. Lamna beds: Western hills from Kobi mud volcano onwards.

The impregnation is sporadic, thus the phenomenally rich fresh-water beds beneath Bibi-Eibat and Surakhany show no signs of oil on their outcrops in the adjacent Yasmal Valley and Zykh, respectively. These facts lend weight to the hypothesis that their oil is in secondary accumulation, which would have been facilitated by the downward increase of permeable strata and the big unconformity above the Lower Miocene. The temperatures of the oil at Bibi-Eibat have been acquired in accordance with the geothermals, hence the invasion must be mainly a long accomplished fact.

Of the eight horizons, the third has importance in Surakhany for gas and "white oil;" the fourth is the most prolific and is of value in Surakhany, Saboontchy, Romany, and Bibi-Eibat; the fifth in Balakhany, Binagady, Holy Island, Khurdalan, on Atashka, and near Puta Station.

Surakhany.—The Pliocene and Miocene rocks are folded into a broad, flat anticline striking north and south. Eastern dips are 10° to 20°; the western 4° to 10°. The visible fold continues to the north end of Surakhany Lake and southward toward the faulted area at Zykh. The crest is much faulted and in the salt lake are numerous fissures filled with inspissated oil, while over a wide area fissures emit gas. The oil zone having now been proved, by drilling, to continue through to Romany, it is probable that the two areas are on one curving fold.

Gas springs occur over the whole central part of the district, in the Lake, on the hill Atashka ("eternal Fires"), at the Temple, and in the depression of Karatchkhur. To sink 20 to 30 feet is enough to strike gas. The upper gas beds cover an area of 4800 m. by 1500 m. (1780 acres) and represent the apex of the fold. Outside this area, the same beds contain no gas. Drilling has shown that all porous beds in the upper strata contain gas; the lower, gas and oil. From 36 m. (118 ft.) to 480 m. (1575 ft.) twenty-three gas sands were struck, the pressure at times reading 30 atmospheres.

White oil begins at 200 m. (656 feet) at the top of the Akchagylian, and increases downwards. Only the central region is oil bearing. From 200 to 335 m. (656 to 1099 feet) five white oil sands were struck. The specific gravity is 0.785.

Black oil was first struck at 480 m. (1575 feet) in the fresh-water formation, as previously determined by Golubiatnikov. During recent years, great development has taken place below this. The first horizons yielded oil having a specific gravity of 0.820.

Balakhany, Saboontchy, Romany.—A wide, faulted anticline represents the continuation southeast of the mud volcano Bog-Boga of two folds, that of Kir-Maku to the northwest and Binagady more westerly. The fold pitches to the southeast, disappears beneath the Pliocene beyond Romany, but is probably continuous with Surakhany. The fresh-water formation covers most of the field, the unfossiliferous series appearing in the salt marsh of Kir-Maku. The oil in the upper beds at Romany is lighter, in the lower beds at Balakhany heavier.

Bibi-Eibat.—This is a dome plunging north-northwest and possibly beneath the sea. At its crest are two subsidiary parallel domes, one with its apex on Group XIX, the other roughly on Group XX. Between them, the shallow minor syncline forms the low hill running out to sea at Cape Naftalan. Much minor faulting, usually parallel to the major axis, occurs. The fresh-water beds are exposed around Naftalan where the best production has been obtained. The beds are very uniform lithologically, the sands being fine to medium grained, the former like dust and known as "gas sands" to the driller, while alternating clay and fine sand is termed "gas clay." "Water sands" are cemented with lime, "oil sands" are loose and when saturated with gas and oil are thought to resemble caviar. The occurrence of hard concretions of sandstone probably accounts for the removed cementing material.

Ignoring the beds of inspissated oil and gas and oil shows in upper beds, the first important pay was struck at 280 feet. Other oil sands were struck at intervals but were exhausted down to 700 feet before any study of the field was made. Between here and 640 m. (2100 feet) were twenty workable sands with a total thickness of 120 m. (390 feet). Water sands were few and it was only below 2600 ft. that the predominance of sands made water shut-off the problem it now is. Water occurs in all sands and made the marginal plots unprofitable.

Binagady, Khurdalan and Puta.—These areas are geologically much alike. Oil is obtained from the unfossiliferous series, which are folded into much faulted anticlines. The oil is heavy. Binagady became prominent as a producer during the war; the others are classed in the "hand dug" production.

Holy Island.—The Pleistocene beds here rest directly on the unfossiliferous beds, very much disturbed, with the Spirialis horizon just showing to indicate the succession. The fold is an elongated dome with the major axis northwest; it is asymmetrical with overfolded side in places. It is much faulted and there is evidence of other domes outside the developed area (in the northern part of the Island).

Seepages occur at the southern end of the anticline and in the central salt marsh and mud volcanoes, etc., along the crest. The oil has infiltrated into the Pleistocene and has formed Kir deposits in the sandstones of the northeast part of the fold. This part has been developed with the drill, the wells giving 800 poods daily from 1300 feet. The specific gravity is 0.944.

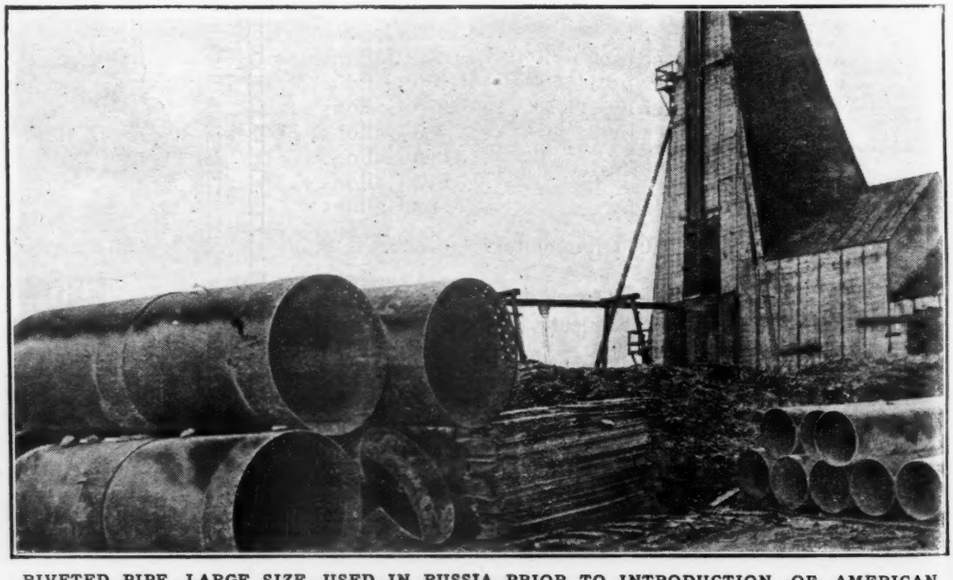
Grozny.—Outside the Apsheron Peninsula, the most important field is Grozny. Here are two folds. The old field is an elongated asymmetrical dome, slightly bulging outwards on its steep side, accompanied with dip faulting, which marks out distinct provinces as regards water and richness of pay. Dips on the north vary from 40° to 90°; on the south, from 20° to 30° and flatten out at the ends to 6° to 15°. The length is 9 miles west northwest.

The new Bellik field is a nearly symmetrical fold and lies to the east of the old field.

As shown by the columnar section, Table 2, the beds are of Miocene age, the oil occurring in the Chokrakian (transition Mediterranean-Sarmatian), and they do not outcrop. Just at the apex of the old field, the overlying Spaniodontella beds are exposed. The oil occurs in sandstones associated with shales, sandy clays, limestone, and dolomites; whether in situ appears doubtful.

Maikop.—Here oil occurs in beds of Upper Oligocene age, in a succession of shales, marls and sandy beds. Beneath is a thick mass of foraminiferal marls, above are the Mediteranean-Sarmatian beds of the Chokrakian limestone. The Tertiaries lie unconformably upon denuded Cretaceous rocks at Shirvansky, the oilfield region, no Eocene beds being interposed, but farther west these latter appear. The oil sand is a narrow strip down the dip and probably represents a former river bed. It is sealed, by overlapping against some of the Cretaceous islands penetrating the foraminiferal marls; the dip of the Tertiaries is 10°. The Pioneer well was able to show a yield of 375,000 barrels from the shallow depth of 281 feet.

About 140 km. (87 miles) westward lies Kudako where the first Russian gusher was struck, in February, 1866, at a depth of 70 feet with a reported yield of 1,000,000 poods (120,500 barrels). Subsequent wells reached 700 to 1050 feet under conditions similar to those at Maikop. The specific gravity of the oil was 0.840 to 0.865. Another small pool was opened at Tweddle in the early eighties, by the River Il, with production from both the



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oil sand and the overlying Chokrakian, the latter being a heavy oil.

Berekei.—Here a much faulted anticline occurs involving much the same horizons as at Maikop, but oil occurs in many horizons and, being associated with hot water, may come from some depth. Its specific gravity is 0.868.

Cheleken.—The actual productive area is in the southwest corner of the island, where there is a dome with its major axis northwest, but with dips southwest of 15° to 50° and northeast of 18° to 20°. It is much faulted parallel to the axis and the steep side is involved in a trough fault, whence the best production of late years has been obtained. The dome itself has produced for many years. Toward the center of the island, the larger dome of Chokrak has many indications, but the productive Pliocene beds have been denuded and the underlying continental formation of unknown age is exposed.

Emba.—Here the surface is entirely covered by Pleistocene beds and the subsoil structure can only be explored by the drill. Salt masses occur and the detailed geology has not yet been worked up.

Ferghana.—The Syr-Darya (Jaxartes) valley is a Cretaceous-Tertiary basin lying between the western continuation of the Tienshan mountains and the Zarafshan-Chain. Oil indications occur in the margins of the Cretaceous rocks and are associated with rather complex secondary anticlinal structure often partly concealed by Pleistocene rocks. The worked fields of Chimiono are on the southern margin.

Drilling Operations

Owing to the highly disturbed and unconsolidated sediments in the Baku oil fields it has been found impossible to adopt the standard American cable system or even the rotary. The need for wells having exceptionally large initial and completed diameters is due to the necessity of excluding waters and penetrating swelling and caving ground during progress, as well as to permit of the extraction of oil by bailers; consequently, the "stove-pipe" system is mostly employed. Initial diameters of 36 to 40 in. (91 to 101 cm.) are usual when ultimate diameters of 12 to 14 in. are desired at a depth of 2000 feet. Massive surface gear is necessary to manipulate colums of such size and tools of such weight. Engines or motors of 50 to 60 hp. are usually employed to drive the rigs.

Because of the enormous volume of sand expelled or raised with the oil, the drilling difficulties of the Baku oil fields rather increased with the development of the field, thereby neutralizing the favorable influence of natural im-

Table 2.—Sections of Grozny Field (after Charnotsky)

	Stage	Formation	Thickness, Meters	Lithological Character
Miocene.....	Meotic.	Akchagylian	Up to 425	Limestones, conglomerate of limestone pebbles, calcareous sandstone, and clayey sands, calcareous clays.
		Unconformity.		
	Middle Sarmatian formation.	Beds with fish and remains of Cetacea.	43	Calcareous (and shaley) clays with numerous limestone beds.
	Transition from Sarmatian to Mediterranean.	Spaniodontella beds.	50	Shales, sandy clays, clay sandstones, calcareous clays and sandstones, pure sandstones, water sands.
		Chokrakian.	370	Shales, sandy clays, clay sandstones, pure sandstones, calcareous sandstones, limestones, (often nodular), dolomite; sandstones oil bearing.
	Mediterranean.	Spirialis beds.	?	Black shales, limestones, black nodular limestones, dolomite.

Table 3.—Section of Neftianaia-Shirvanka

Stage	Local Horizon	Thickness, Meters	Lithological Character
Meotic.	Congeria Panticapea beds.		Dolomitic limestone, at base dark marls.
	Unconformity.		
Upper Sarmatian.	Mactra Saspia beds.	25-30 +	Thin clay beds, a few think partings of ferruginous sandstone, shell beds, gypsum.
Middle Sarmatian.	Beds with typical Middle Sarmatian fauna.	thin	Dark gray clays, at top beds of shells.
	Cryptomactra beds.		Dark gray marls, at base thinly laminated gray marls.
Lower Sarmatian.	Beds with Lower Sarmatian fauna.	400-500	Shell limestones.
	Beds with fish and plant remains.	in E	Dark gray marls with beds of gray thinly laminated marls.
Middle Miocene	Spaniodon beds.	10-15	Compact marly limestones with porous partings.
Mediterranean	Spirialis beds.	200-400	Dark marls and yellow gray marls.
Lower Miocene.	Chokrakian.	20-25	Sands and limestone, shell beds, dark marls.
Upper Oligocene.	Oil formation.	225 (Neftianaia) 480 (r. P. shekha) 800	Dark shaley marls not efferverscing in HCl; beds of coarse sands and sandstones becoming gravels in places or conglomerates; most beds contain oil.
Middle Oligocene.	Foraminifera beds.		White clays and marls, beds of shaly bituminous marls.
Lower Oligocene	Beds with Pecten Bronni.		Green-gray marls.
	Unconformity.		
Senonian.	Unconformity.		White chalk marl with few beds of dark marls and coarse sandstones.
Aptian.	Beds with Ammonites.		Dark sandy clays with beds of coarse sandstone.

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provements that were gradually introduced. Usually from 1 to 3 years were occupied in drilling the deeper wells, and their cost, in prewar days, was not less than $25 a foot; nearly 50 per cent of this sum was for the casing alone.

Amid such disturbed and loose sediments, no water-flush system was permissible as the water freely entered partly exhausted sands and found access to all surounding wells, from which it was bailed. Away from the old fields, as at Surakhany, where a considerable thickness of more consolidated, non-petroliferous (or slightly so) beds have to be penetrated before the normal loose, oil-yielding facies is reached, rotary drilling has proved successful and greatly accelerated progress has been made.

The system in vogue is the free-fall which, being operated by rods from the walking beam, transmits a positive action to the drill, enabling tools to be rotated against a resistance and the motion of underreamers to be positive. Wire-rope cable drilling has been successfully performed in the Baku oil field under skilled direction, but the risks are great and the ultimate speeds never exceeded those of the free-fall drilling system. Rarely could more than a few feet be left unlined without danger, and often 70 per cent of the time was occupied in the maintenance of the freedom of the column of casing to insure its descent of only a few hundred feet.

Grozny Strata Compact

Unlike Baku, the Grozny strata are much more compact, and although many of the productive beds are unconsolidated sands which are freely expelled with the oil, the intervening beds hold up sufficiently to permit the employment of standard wire-line cable drilling, consequently quicker work results. The prewar cost of wells 3000 feet deep did not exceed $12 per foot, of which about 50 per cent was for the casing. In the Ural-Emba oil field, where great thickness of gypsum and salt have been pierced and the ordinary sediments are fairly consolidated, the rotary drill has proved highly successful.

Many of the companies operating in the Maikop oil field used the old free-fall system, others used Galician rigs, but in the shallow field portable Star rigs were found to accomplish just as fast work as the others, while making unnecessary the use of expensive derricks, and lengthy dismantling and re-erection of plant on the completion of each well.

Chelcken conditions resemble those of Baku and wells entail long and costly work to complete.

The main feature distinguishing Russian from American practice is the design and employment of positive tools, owing to the great difficulties of dealing with loose sediments and the enormous financial losses sustained by the abandonment of a well that has required several years to make and on which perhaps $50,000 or more has been expended. Of exquisite design and workmanship, many of the fishing tools cost thousands of dollars, and they were invariably used on solid or hollow fishing rods, which permitted the most delicate handling and certain release if they failed in their object. All fishing rods had a loose collar joint and feather so that they could be rotated right- or left-handed at will; reliance never was placed on a trip movement, as is the case with many American fishing tools. Owing to the heaving nature of the beds, it was often essential to employ powerful water flushes to free the material around a lost bit; for this purpose 3-inch pipes were customary.

The enforced use of riveted stove-pipe casing rendered cementations for water exclusion lengthy, and delicate operations, as the failure to hold water or resist pressure without leakage prevented the simpler American circulation systems from being adopted. Anything beyond a shoe cementation made it imperative to fill the casing with earthy matter and its subsequent extraction was often as difficult as drilling a new well in most countries.

Production Methods

During the early history of the Baku oil field, practically all wells penetrating a virgin sand body of any importance flowed so violently that their effective control was practically impossible. Enormous masses of sand mixed with boulders and pieces of rock were often ejected for days and weeks, rendering approach to the well dangerous. Single wells have given for weeks as much as 10,000 tons daily of sand mixed with an equal weight of oil, and all objects placed to obstruct or deflect discharge were destroyed or perforated in a few hours. Usually hardwood blocks or

CLAMPS USED IN HANDLING LARGE SIZE RIVETED PIPES USED IN RUSSIAN FIELDS

chilled, cast-iron plates, 12-inches thick, were pushed over the mouth of the well some distance above the ground, and the vertical jet was thereby deflected horizontally. These "fountain shields," as they were termed, were replaced as they became destroyed.

The wells themselves did not escape damage as the casing was often torn to shreds, each soft rivet causing the initiation of a vertical rifling that extended upwards as the sand-blast action continued. In certain regions, when excessive gas pressures were encountered, well after well was sunk and destroyed after a few days' eruption before the pressure was relieved sufficiently to permit normal development. Occasionally, sand only or oil-soaked clay would be expelled for days, or even weeks, before oil entered or deepening could be resumed. On the cessation of flowing, the wells were often in a delicate condition and remunerative yields, free from water that entered the damaged casing, could only be secured by the maintenance of a high head of oil that, usually, exceeded the static head of upper water sources. Such a condition could only be effected by keeping the well clear of sand at the bottom and so facilitating the entry of oil. A little water that practically always gained admission and collected near the base of the well not only served to compact the sand, but greatly impeded the entrance of oil; consequently, the water had to be abstracted at regular intervals. The only method of handling such a condition was by bailing, and the scientific application of this principle reached a high degree of efficiency in the Russian oil fields.

Bailing drums 16 feet in circumference were driven by engines developing up to 150 hp. each, and velocities of 1500 ft. per minute were common. Single bailers up to 7.5 bbl. capacity were used in large-diameter wells of great yields and productions up to 2000 bbl. daily were raised by this method. The mean cost of bailing Baku wells in prewar days, averaging 120 bbl. a day each, was under 20 c. per bbl. but the large yielding wells individually would cost but a fraction of this to bail.

The only other process for raising oil that met with success under the early Baku conditions was the air-lift. In wells of small diameter with a high level of liquid where bottom bailing had to be frequent to remove water and sand accumulations, the air-lift proved successful. Although the cost of operating the air-lift greatly exceeded that of bailing, the excess costs were often repaid many times by the augmented yield. Emulsions in some cases gave trouble, but usually sandy water and oil were alternately discharged at more or less regular intervals during continuous or intermittent working as the case might be. In low-level wells all discharges were intermittent in operation; in high-level wells, the discharge was continuous.

With the gradual reduction of gas pressure on the Baku oil fields, opportunities arose for the use of pumps in the less sandy wells, but the constant need for renewals of cup leathers, barrels, or plungers has caused the system to be unpopular. The oil is never quite free from sand and, as the density of the oil is light and quickly sinks in the column, there is a tendency for the plunger and valve to become choked up if left idle for a few minutes.

There are fewer objections to the use of pumps in most of the other oil fields of Russia but while the period of intermittent flowing continues bailing is preferred in order to keep the well clear of sand. Deep well pumps are used in the Grozny and and other fields when the wells have settled down.

Oil-Field Yields

The Baku oil fields are by far the richest yet discovered. Not merely are the loose uncemented sands capable of high absorption, but they are plentifully distributed throughout a depth of several thousand feet of sediments and often reach a considerable thickness. Thus, within the confines of a single plot, a dozen highly productive sands may be struck aggregating several hundred feet in thickness. A selected plot at Bibi-Eibat has yielded nearly 2,500,000 bbl. per acre, and the whole operated area of 250 acres in that field has produced over 1,500,000 bbl. per acre. Even the greater Balakhany-Saboontchy field of Baku, aggregating about 2600 acres, has yielded fully 500,000 bbl. per acre and is still capable of enormous collective production, though the individual output of wells is now small. Enough oil has been abstracted from this field to cover the whole area to a depth of 63 ft. neglecting entirely the many millions of cubic feet of gas with its contained gasoline that has been lost.

The influence of interference and the process of exhaustion is, perhaps, best illustrated by the steady decline of initial productions of new wells. Between 1892 and 1896, the first half yearly output of new wells was around 108,000 bbl. (600 bbl. per day). In 1912, this had fallen to 15,000 bbl. (80 bbl. per day) and during the same interval the ultimate yield had sunk from 675,000 bbl. per well to about 225,000 bbl. In 1895, the average annual production of wells at Baku was 75,000 bbl.; in 1909 the average had been depressed to 30,000 bbl. although in the same period wells were on an average 60 per cent deeper. In the Bibi-Eibat field, footage ceased to increase or even sustain production after 1904 when the zenith of production was attained in that region.

High Potential Production

Civil disturbances for some years prior to the war and general disorganization since make any estimates and predictions of little value. The fields are still capable of giving enormous quantities of oil, and their present potential capacity is probably between 25,000,000 and 20,000,000 bbl. a year Much local speculation is aroused as to the results that will attend the drilling of reclaimed plots in Bibi-Eibat bay, the Great Lake of Romany, and large reserved areas surrounded by old producing plots.

An unusual amount of scientific interest surrounds the obsequies of these famous Baku fields, and it would be a world's loss if trustworthy data were not kept for the benefit of our successors. The final phase is apparently in sight, as what appears to be basal water has been penetrated beneath the great oil-bearing series. Considerable thickness of water-bear-

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ing sands exist, but whether these are underlain by other oil-bearing sands it is difficult to say. One would surmise not, and there is just the possibility that the upper riches may be partly due to the expulsion of the former oil contents of these beds by water.

At present, the dregs of these vast oil fields are being mainly secured through the medium of water which has percolated into the disrupted and badly disturbed beds from which sufficient solid matter alone has been flung by thousands of wells to raise the oil-field surface many feet and the depth of oil over 60 ft. From the thousands of wells a mixture of oil and water is constantly being raised, but both the oil and the water contents are being reduced. Some areas no longer yield water at all where formerly expensive measures had to be undertaken for its exclusion; here the least oil is now obtained as natural filtration without the aid of gas or water is insignificant. At other points the static head of the liquid is gradually falling, and unless the lower water is admitted the whole field may be eventually dried up. No synclinal or edge water encroaches on the exhausted upper oil strata that cannot be overcome by bailing, so that the chief migration of oil may have been vertical rather than lateral.

Natural Gas Obtained

The Surakhany field to the east of the Balakhany-Saboontchy area has now become the most interesting in the Baku zone. Years ago, the deep development of the oil series was predicted by geologists and their prediction have been verified. Enormous volumes of natural gas were obtained from shallow fine sands in the area and the product was piped to the oil fields for fuel. At increased depths, gushers of white oil, specific gravity 0.785, were struck in similar sands, and there is now little doubt but that they represented a filtration product of migration from the underlying normal series.

Large gushers of the typical Baku grade oil have been struck in the Surakhany area where an active development was in progress until the war.

In the Grozny oil field, wells have given very substantial productions along a belt of many miles. No area has excelled in productivity the original plot on which the first well was drilled, about 1897. This point corresponded with the maximum elevation on the pitching anticline and attracted by its surface manifestations. This plot has yielded over 320,000 bbl. of oil per acre. In 1914, the yield was 10,500,000 bbl. from about 8000 acres. The field has yielded about 150,000 bbl. per acre and is still far from exhausted. After an initial flow, wells continue to yield normally. A typical well yielding an ultimate production of 80,000 bbl. gives about 50 per cent of its total production in the first year, 22 per cent in the second, 15 per cent in the third, and 7½ per cent in the fourth.

Exceptionally good results were obtained on the Bellik oil field, discovered in 1912. It is really an extension of the old Grozny oil field or a parallel fold. Pioneer wells gave large and sustained flows, and an important field is likely to result, possessing the Grozny characteristics.

Emba Field Looks Likely

No detailed statistics are available concerning the important Emba oil field of the Uralsk. Large flowing wells were struck in some number near Dossor and considerable shipments of oil were made to the Volga. There is every indication of a large and useful field being opened up. The Island of Cheleken, off Krasnovodsk, gave its maximum output in 1912, when 1,500,000 bbl. were reported. In 1913, the production was under 1,000,000 bbl. and the fall continues. Activity was confined to the Ali Tepe sector, which area seems to have passed its best days. Holy Island has attracted sporadic attention and appears to justify more. One company operates and produces about 800,000 bbl. a year when conditions are normal.

The small field near Shirvansky, known as the Maikop, has yielded over 4,000,000 bbl. of oil; a production of about 250,000 bbl. a year is still maintained despite the fact that the area has not been greatly extended.

Little information is forthcoming about Ferghana oil field of Turkestan. At one time the production reached 450,000 bbl. a year and the oil found a ready local sale in that part of the world. At Maili Sai, no further drilling has been undertaken.

Tests in Caucasian Belt

Innumerable abortive or uncertain tests have been made in the Caucasian oil belt. Some were undertaken at a time when nothing short of 500-bbl. wells attracted any interest at all. At many spots productions have obtained that would pay well in any part of the world. All along the Caspian Sea coastal belt, from Baku to Derbent, there are frequent and encouraging indications of oil. At Berekei, a little northwest of Derbent, about 500,000 bbl. of oil were taken from a field in which 2000- to 5000-bbl. wells were struck; but water troubles eventually drove away nearly all operators. At Kaikent, a large gusher was struck in an initial effort, although all subsequent wells failed. Around Baku at Binagadi, a much despised region left for years to peasants to develop by primitive methods gave, in 1913, 1,700,000 bbl. of oil and has since exceeded 4,000,000 bbl. a year. At Puta and Khardalan, a thriving industry developed as a result of handdugs sunk into the outcropping oil sands and an output of 1,700,000 bbl. resulted in 1914. Drilling would yield very different results.

Miles of territory flanking the Caucasus foothills that fringe the valley of the Kura are capable of remunerative development. In some places small wells, still flowing, testify to past efforts, and at many places the peasants satisfy all local wants by sinking shafts into outcropping sands.

At Ildohani in the Tienct valley, near Tiflis, productive wells were sunk that flowed oil of light density in which crystals of wax separated; at other places in the same district fruitless experiments were made with antiquated plant where modern methods might have succeeded. At Chatma, near the River Jora, there are numerous indications of oil and interesting structures.

Miles of the Black Sea littoral and Taman peninsula are potential oil fields; indeed, many dozens of productive wells have been sunk in that region where such stupendous mud volcanoes are in evidence. Russian geologists have estimated that there are fully 30,000 sq. mi. of interesting undeveloped oil land in Russia and this is probably no exaggeration.

EDITOR'S NOTE.—"The Oil Fields of Russia" reprinted above is copyrighted and used by permission of the American Institute of Mining and Metallurgical Engineers.

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The United States and Russia are the only two oil producing countries in the billion barrel class. The United States has been producing since 1859, while Russia gave forth her first oil four years later.

Main Oil Fields of Russia in Order of Their Relative Importance

			Approximate Production, In Barrels	Approximate Proved Area, Acres
North Caucasian	Baku	Balakhany-Saboontchy field, to 1918		2,600
		Romany, to 1918	1,597,690,000	
		Bibi-Eibat field, to 1918		1,000
		Surakhany field, to 1918	54,920,000	
	Grozny	Old Field, to 1917		8,000
		Bellik field, to 1917	139,858,000	
	Binagadi, to 1918		22,620,000	
	Khurdalan, Puta, Berekei	to 1917	9,082,000	
	Holy Island, to 1918		5,562,000	
Emba Ural North Caspian	Dossor, etc., to 1917		8,575,000	
Tcheleken East Caspian	Cheleken Island, to 1917		7,317,000	
	Ferghana field, to 1917		3,620,000	
West Caucasian	Maikop, to 1917		4,750,000	

Table 4.—Approximate Production, in Thousands of Barrels (8.3 Poods to a Barrel)

	Previous to 1914	1914	1915	1916	1917	1918
Baku Oilfields						
Balakhany-Saboontchy		32,000	31,800	29,000	24,600	12,500
Romany	1,427,950					
Bibi-Eibat		8,700	9,550	10,800	7,350	3,440
Surakhany	12,400	6,200	7,270	11,600	11,150	6,300
Binagadi	7,380	2,650	3,930	4,160	3,560	940
Holy Island	1,980	712	844	820	844	362
Khurdalan, Puta, etc.	5,300	840	930	1,180	832	
Terek						
Grozny field	93,800	10,600	9,260	8,280	6,620	*
Bellik field		1,028	1,350	4,100	4,820	
North Caspian						
Emba oil field	845	2,000	1,990	1,870	1,870	
Kuban						
Maikop	2,870	482	915	241	242	
Asiatic Russia						
Cheleken	5,670	602	482	362	201	
Ferghana	2,680	217	241	241	241	

*Five gushers burning 9 months.

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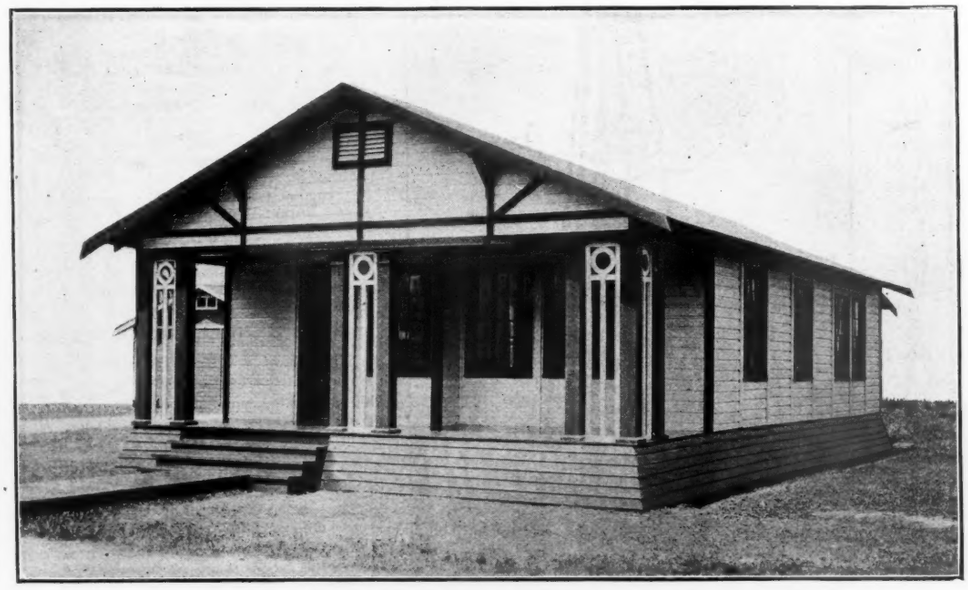

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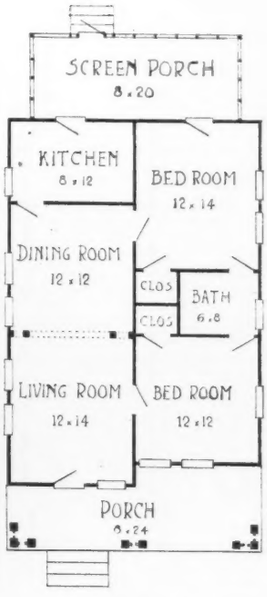

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Cost of Drilling Oil Wells Is Shown

BY extended effort The OIL WEEKLY has been able to gather together data appertaining to the costs of drilling oil wells in various fields. These figures were furnished by companies operating in the fields listed, and as a general rule represent the average cost of a number of wells which have been completed.

Included will be found figures on complete rigs, both standard, rotary and combination. These were furnished by the Lucey Manufacturing Company, to which The OIL WEEKLY is indebted.

Little explanation is required. The story is to be found in the figures which are listed below in the hope that they will be found of value. Due allowance should be made on all items, especially in drilling costs, this because of changing prices and conditions.

West Columbia, by far the most popular of Gulf Coast fields at this time, has been the scene of much operation during the past year. Drilling in West Columbia costs at the rate of $6 a foot, according to reliable reports obtained by The OIL WEEKLY. An increase to $6.50 is not unlikely in the near future. Itemized cost of drilling a well at West Columbia is listed below. This well was drilled by contract, and the costs are as nearly accurate as could be procured. It may be said in explanation that different companies set casing, for instance, according to different beliefs. The well listed below takes 200 feet of 12-inch, 2800 feet of 8-inch, and 600 feet of 6-inch. Other wells use no 12-inch, but set say 1500 feet of 10-inch and then 3000 feet of 6-inch.

The costs listed below obtained October 15, 1920:

COST AT WEST COLUMBIA

Derrick—112 feet		$ 1,140.00
Drilling—		
3300 ft. at $6 a foot	$19,800.00	
200 ft. 12-inch Casing at $3	600.00	
2800 ft. 8-inch at $1.92	4,476.00	
600 ft. 6-inch at $1.35	810.00	
2 joints (40 ft.) 6-inch Screen	420.00—	26,106.00
300 hours reaming and running core barrels, at $5 an hour		1,500.00
Water Well		600.00
Freight and Hauling		1,000.00
Tanks, Flow Lines, etc.		2,500.00
60 days fuel oil, 30 bbls. a day at $3.20		5,760.00
Connections, tools, supplies, etc		750.00
Cost completed well		$39,356.00
Less salvage for producing well		3,000.00
Estimated net cost		$36,356.00
Additional salvage for dry hole		4,350.00
Cost of dry hole		$32,006.00

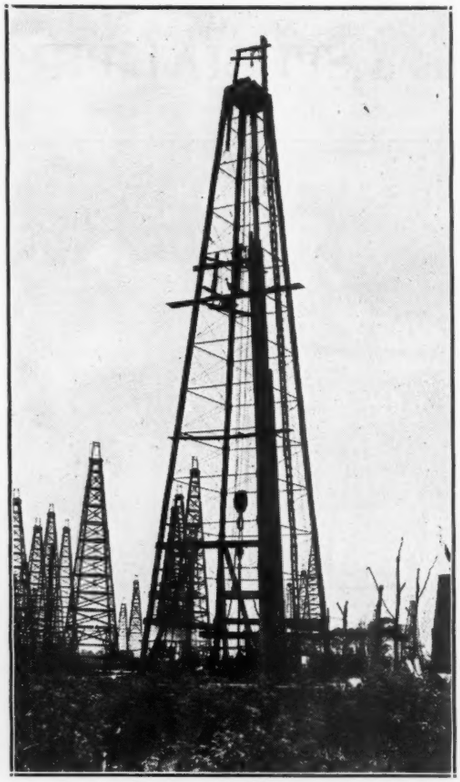
The cost of completing wells in North Texas has not increased materially over the figures which were presented in last year's statistical edition of The OIL WEEKLY. Cost of drilling per foot was given last year at $3 a foot in Ranger. This is given at $5 a foot. Other costs stand practically without change. These figures were obtained from a source absolutely authentic, and represent the cost of drilling, an average of thirty-two wells being taken:

COST OF WELL AT RANGER

1—84'x22' sway braced standard rig with 6-inch Ideal rig irons		$ 4,500.00
Drilling—		
3200 ft. at $3 per foot	$16,000.00	
200 ft. black lime at $10	2,000.00	
15 days under-reaming at $100	1,500.00	
5 days shut down at $70	350.00—	19,850.00
Fuel and water—		
60 days gas at $15	$ 900.00	
Water service	300.00—	1,200.00
Freight and hauling		1,000.00
Tanks, flow lines, etc.		3,000.00

Itemized Figures for Many Sections In Texas-Oklahoma

Casing—		
350 ft. 15½-in. 70-lb. casing	$ 1,862.00	
800 ft. 12½-in. 50-lb. casing	2,648.00	
1400 ft. 10-in. 40-lb. casing	3,430.00	
2000 ft. 8¼-in. 32-lb. casing	3,960.00	
3200 ft. 6⅝-in. 24-lb. casing	4,576.00—	16,476.00
200-quart shot of nitroglycerine		920.00



STEEL DERRICK AT GOOSE CREEK

When the Gulf Production Company decided to drill a real deep test in the heart of the Goose Creek field to see what might be expected in the way of deep pay, it decided upon a steel derrick to eliminate the danger caused by tropical storms in the field.

Goose Creek has suffered from tropical windstorms two or three times in the past, but a steel derrick, in addition to the strain it will stand in handling a few thousand feet of drill pipe and casing, is expected to go through any storm that might come up.

The derrick, shown in the accompanying cut, is what is known as a "turnbuckle derrick," and is of steel and wood construction. It was built by the Slater Steel Rig Company of Tulsa.

The well under the derrick is now drilling below 3000 feet. Unless it gets a mighty good showing it will go considerably below that depth. It is probable, however, that it will encounter a good sand at 3400 feet; but even this will be passed up unless it proves it has an extraordinarily good showing.

This is the first turnbuckle derrick ever used in the coastal section, although the derrick has been used for many years in the fields of Oklahoma and Kansas, and no instance is on record of one ever blowing down or collapsing. The Lee C. Moore Company of Tulsa have a number of all steel derricks in North and West Texas, as well as Mexico, where they are giving entire satisfaction.

Add 10 per cent for unforeseen expenses		4,055.00
Grand total		$51,001.00
Less probable salvage for producing well		6,352.00
Net cost of producing well		$44,649.00
Less additional salvage if dry hole		9,829.00
Net cost of dry hole		$34,820.00

STEPHENS AND YOUNG COUNTIES

1—84'x22' sway braced standard rig with 6-inch Ideal rig irons,California pattern		$ 4,700.00
Drilling—		
3400 ft. drilling at $5 per foot	$17,000.00	
600 ft. black lime at $10 per foot	6,000.00	
40 days under-reaming at $100	4,000.00	
30 days shut down at $75	2,250.00—	29,250.00
Fuel and water—		
1500 cords wood at $5	$ 7,500.00	
Water service	1,000.00—	8,500.00
Freight and hauling		2,000.00
Tanks, flow lines, etc.		3,000.00
Casing—		
300 ft. 20-in. 90-lb. casing	$ 2,160.00	
700 ft. 15½-in. 70-lb. casing	3,724.00	
1200 ft. 12½-in. 50 lb. casing	3,972.00	
1700 ft. 10-in. 40-lb. casing	4,165.00	
2400 ft. 8¼-in. 32-lb. casing	4,752.00	
3100 ft. 6⅝-in. 24-lb. casing	4,433.00	
4000 ft. 5 3-16-in. 17-lb. casing	4,080.00—	27,286.00
200-quart shot nitroglycerine		920.00
Add 10 per cent for unforeseen expenses		7,566.00
Grand total		$83,222.00
Less estimated salvage for producing well		15,217.00
Net cost of producing well		$68,005.00
Less additional salvage if dry hole		10,612.00
Net loss if dry hole		$57,493.00

Note.—This estimate will be found fairly accurate for wells drilled in eastern Callahan and Shackelford Counties.

DRILLING IN OSAGE

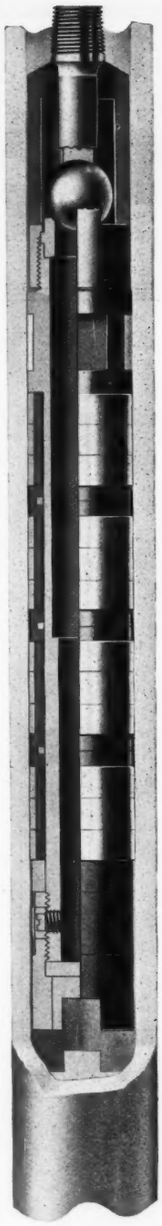
The cost of drilling an 1850 foot well in Osage (Oklahoma) is itemized as follows:

Standard Rig, complete	$2,650.00
Wood Conductor	30.00
550′ 10″ Casing 32 lb	1,200.00
1350′ 8¼″ Casing 24 lb	2,200.00
1800′ 6⅝″ Casing 17 lb	2,400.00
1850′ 2″ Tubing 4 lb	525.00
1850′ Iron Sucker Rods	200.00
1850′ Hole at $2.25 per foot	4,162.50
Pumping Jack and 2″ Outfit, complete	150.00
1800′ Lead Line	400.00
Freight and Hauling	1,000.00
Tankage	400.00
Fuel (Gas, $25 a day; water, $10 a day)	1,000.00
Cleaning, Pulling Casing, etc	2,500.00
Shot	750.00
Total	$19,560.50
Plus 10 per cent unforeseen expense, accidents	1,956.00
Grand total	$21,496.50
(No allowance made for pumping here, as most wells are pumped from central power.)	
Salvage for producing well—10″ casing, less 25 per cent for depreciation	900.00
Net cost producing well	$20,596.50

Salvage for Dry Hole

	Original Cost	Percentage Depreciation in use	Value Recovered
10″ Casing	$1,200.00	25	$ 900.00
8¼″ Casing	2,200.00	25	1,650.00
6⅝″ Casing	2,400.00	25	1,800.00
Tubing	525.00	25	396.00
Rods	200.00	25	150.00
Pumping Outfit	150.00		150.00
Lead Line	400.00		400.00
Tankage	400.00		400.00
Rig	2,650.00	50	1,325.00
			$7,171.00
Plugging Dry Hole			$800.00

(Continued on page 176.)



Pump

DRISCO PATENTS

ARE

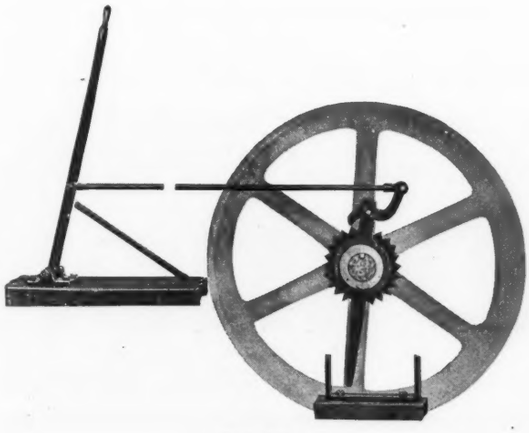
TIME SAVERS

Drisco Humason Pump

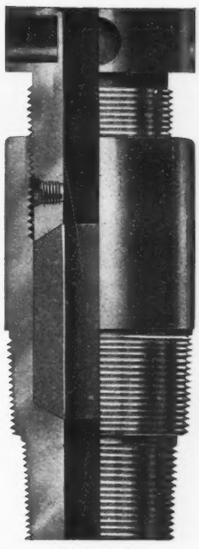
for sanded wells, or any well. Tests made in all coastal fields. Saves pulling rods. Does away with leather cups. Absolute satisfaction guaranteed.

Kick Off

for throwing engine from dead center by pulling lever on derrick floor. Saves money, time and lives.



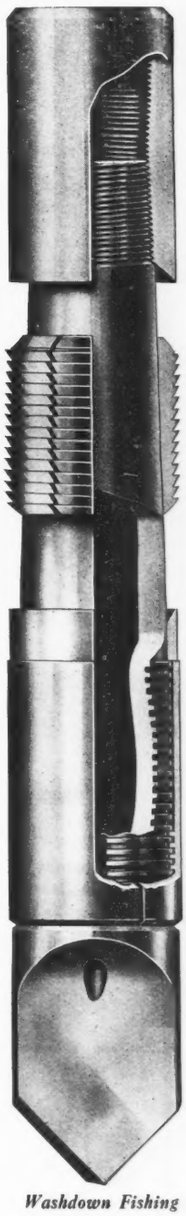
Kick Off



Stuffing Box

Drisco Stuffing Box

Made from special steel. Will outlast ten ordinary stuffing boxes.



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Washdown Spear

combining both Bull Dog and Trip Spear advantages in one. For the price of the cheapest.

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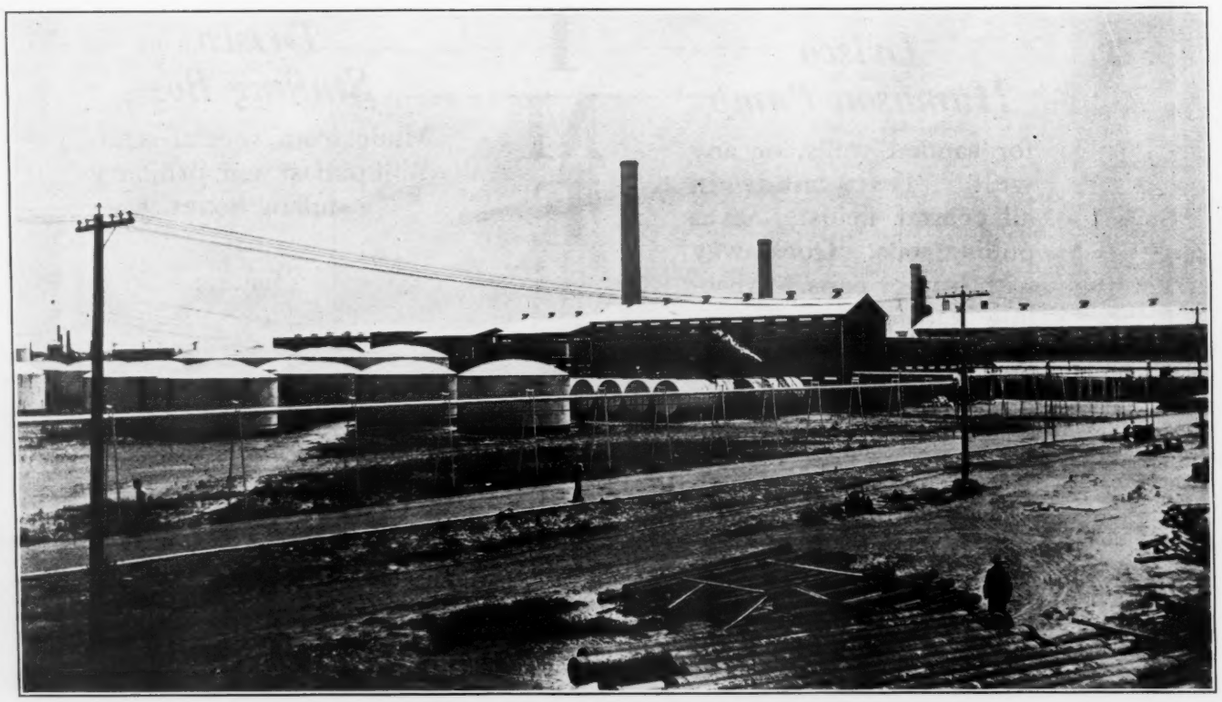
Thru the 7 Plants Southwest

"United" Equipment

STEEL FABRICATION



One of the Largest Refineries in the Southwest—in the construction state

"United" fabricates and builds complete Refineries, Skimming Plants, Tankage, Stills, Etc.,—"from the ground to the run," United careful details assure you equipment that's built for the future.

Stills
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"United" Plants, distributed thru the Southwest this most active and large territory—United delivery, and GUARANTEED

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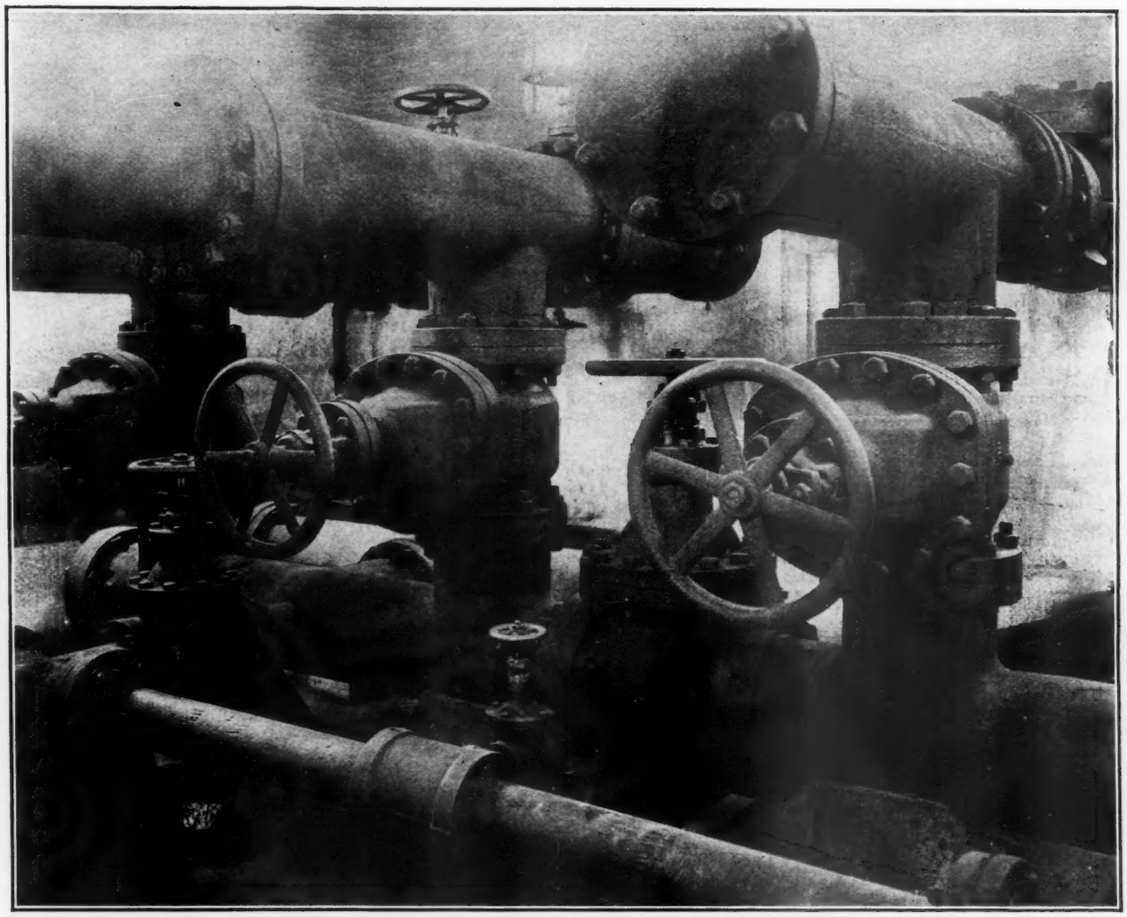

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give "At Home Service" to the oil industry of Plants offer you shorter freight hauls, good Built Right Supplies

Ells, Tees
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Trade "UNITED IRON WORKS INC. FOR SERVICE" Mark

Say you saw it in THE OIL WEEKLY

COST OF DRILLING OIL WELLS IS SHOWN

(Continued from page 172.)

OSAGE—Continued.

Cost Drilling Dry Hole	$22,296.50
Recoverable on Dry Hole	7,171.00
Net Cost of Dry Hole	$15,125.50

OKMULGEE COUNTY

The cost of drilling a well in Okmulgee County, Oklahoma (2500 foot test), is itemized as follows:

Rig and Irons, complete	$ 3,000.00
16″ Conductor	25.00
600′ 50 lb 12½″ Casing	2,100.00
1400′ 32 lb 10″ Casing	3,000.00
2100′ 24 lb 8¼′ Casing	3,400.00
2430′ 20 lb 6⅝″ Casing	3,200.00
2500′ Tubing	700.00
One 2″ Pumping Outfit	100.00
2500′ ⅝″ Rods	250.00
One 25 h. p. Gas Engine	1,500.00
Labor and Material for Installing Engine and Engine House	1,000.00
1800′ Lead Line	700.00
Tankage	400.00
2500′ Hole at $2.35 per foot	6,875.00
Freight and Hauling	1,000.00
Fuel	1,500.00
Pulling, Cleaning Out, etc	2,500.00
Shot	600.00
Total	$31,850.00
10 per cent accidents and unforeseen expense	3,185.00
Grand total	$35,035.00
Salvage producing well—12½″ and 10″ Casing, less 25 per cent for depreciation	3,725.00
Net cost, producing well	$31,310.00

(Note—Cost here includes rigging the well to pump on beam, instead of from central power.)

Salvage—Dry Hole

	Original Cost	Percentage Depreciation in use	Value Recovered
Rig	$3,000.00	50	$1,500.00
12½″ Casing	2,100.00	25	1,575.00
10″ Casing	3,000.00	25	2,250.00
8¼″ Casing	3,400.00	25	2,550.00
6⅝″ Casing	3,200.00	25	2,400.00
Tubing	700		700.00
Rods	250.00		250.00
Pumping Outfit	100.00		100.00
Gas Engine	1,500.00		1,500.00
Labor and Material installing pumping equipment			1,000.00
Tankage	400.00		400.00
Lead Line	700.00		700.00
			$14,925.00
Total cost drilling			$35,035.00
Recoverable			14,925.00
Cost dry hole			$20,110.00
Cost plugging dry hole			1,000.00
Net cost drilling dry hole			$21,110.00

HEWITT FIELD

The cost for drilling a well in Hewitt field (Oklahoma) is itemized as follows:

Rig and Irons, complete	$ 4,515.00
2025′ 8¼″ 32 lb Casing	4,050.00
Tankage	400.00
2062′ Hole at $8 per foot (see notation)	16,200.00
Freight and Labor	2,790.00
Fuel	2,840.00
Equipment—Fittings, ells, etc	175.00
Total	$31,070.00
Plus 10 per cent accidents and unforseen expense	3,107.00
Total cost of well	$34,177.00

(Note—This was a flowing well, and no items made for tubing, rods, shot, pumping equipment, etc. Where well is pumped, get itemized list of costs from Okmulgee County well. Also no salvage on this well.

Salvage on Dry Hole

2025′ Casing	$ 4,050.00
Net cost of dry hole	$30,127.00

(Note No. 2—This well drilled with rotary, and standardized at top of sand. Item "Rig and Irons" includes all cost incident to changing tools. Drilling contractor furnishes all tools, drill pipe, etc., and this is covered in price of $8 a foot for drilling.)

COST OF COMBINATION OUTFIT

Herewith is given a complete list of tools, etc., needed for a combination rotary and cable tool drilling outfit, together with their cost on September 25, 1920:

Quantity	Article	Cost
1	50 H. P. Locomotive Type Oil Country Boiler, complete	$ 1,734.00
1	12x12″ Drilling Engine, complete	719.00
1	6x4x6″ Boiler Feed Pump	260.00
1	Generator, with Lamps and Wiring	275.00
1	Injector	27.00
1	Oil Burner	8.25
30′	No. 1240 Chain Belting	121.50
60′	No. 1030 Chain Belting	135.00
1	10″ 6-pulley Crown Block	452.00
1	48″ 3 Sheave Traveling Block	380.00
1	⅞″x1050′ Drilling Line, cast Crucible Steel	207.90
1	Reversible Pipe Tong Handle	74.25
1	15½″ Pipe Jaw	97.68
1	12½″ Pipe Jaw	85.80
1	10″ Pipe Jaw	75.62
1	8¼″ Pipe Jaw	69.63
1	6⅝″ Pipe Jaw	56.65
1	5 3/16″ Pipe Jaw	56.65
1	4″ Drill Pipe	56.65
1	Set 8¼″ Elevators with 2½x42 Bails	343.20
1	Set 10″ Elevators with 2½x42 Bails	409.20
1	Set 12½″ Elevators with 2½x42 Bails	475.20
1	Set 15½″ Elevators with 2½x42 Bails	563.20
1	5″ Double Swivel Drilling Hook	105.00
1	5″ Strapped "O" Hook	60.00
2	No. 15½ Chain Tongs	18.00
2	No. 14 Chain Tongs	22.00
2	No. 15 Chain Tongs	36.00
2	No. 16 Chain Tongs	80.00
1	Set 6″x7′-6″ Rig Irons complete, with 7″ and 9″ Brake Bands with 5″x9′ D. D. Sand Reel, Guy Wire, Nails, Bolts and Washers and 55′ No. 1030 Sprocket Chain	1,775.00
1	⅞″x4000′ 6x19 Steel Drilling Line, Crucible Steel, extra strong	870.00
1	9/16″x4000′ 6x7 Sand Line	300.00
1	⅞″x750′ 6x19 Steel Casing Line	168.30
2	2¼″x90′ Manila Bull Ropes, approximate weight 300 lbs.	91.50
1	12″ 6-ply x 90′ Stitched Rubber Belt	248.40
1	2¼″x1600′ Manila Drilling Cable, approximate weight 1425 lbs.	488.06
1	Front and Rear Casing Wagon, per set	40.00
1	1½-ton Chain Hoist	56.00
1	No. 2 Barrett Jack and Circle, complete	101.00
1	300 lb. Bit Ram	54.00
1	Steel Derrick Forge	45.00
1	Oklahoma Pattern Tool Box	63.00
1	300 lb. Arch Anvil	75.00
1	Steel Slack Tub	25.00
1	15½″ Spider and Slips for 15½″-12½″, with Liner and Slips for 10″, 8¼″ and 6⅝″	705.00
1	Set Santa Fe Back-up Tongs	90.00
30′	⅜″ Link Chain	2.00

Derrick Tools and Appliances

1	15″ Wrench	2.40
1	18″ Wrench	3.20
1	18″ Trimo Wrench	2.75
1	14″ Trimo Wrench	2.54
1	24″ Trimo Wrench	5.96
6	36″ Sledge Handles	2.70
2	16 lb. C. P. Hammers	5.76
1	7-point Hand Saw	3.10
2	Long Handle Round Pointed Shovels	3.10
1	12″ Ratchet Brace	3.15
1	Spirit Level	2.20
1	24″ Carpenter Steel Square	2.40
2	1″ Cape Chisels	1.92
4	1″ Hand Cold Chisels	3.52
1	20″ S. L. Blacksmith Tongs	1.50
1	20″ C. L. Blacksmith Tongs	1.50
1	Derrick Hatchet	1.80
1	Single Bit Axe and Handle	2.10
1	Stock and Die—1″ to 2″	18.00
1	Stock and Die—2″ to 4″	115.00
1	3-wheel Pipe Cutter	3.42
2	3 lb. Ball Pein Hammers	2.45
25	lbs. Plain Graphite	11.25
6	Extra Wheels for 3-wheel Pipe Cutter	1.71
1	Screw Plate	39.90
1	Combination Bench and Pipe Vise	30.40
1	10″ Iron Snatch Block	9.00
1	Hack Saw Frame	2.25
1	Doz. 12″ Hack Saw Blades	1.30
1	⅞″x18″x36″ Ship Auger	3.20
1	1″x18″x36″ Ship Auger	3.56
1	Patent Auger Handle	0.90
100	lbs. No. 4 Babbitt	21.00
1	6″ Babbitt Ladle	2.10
25	lbs. 1/16 lb. Red Sheet Packing	12.50
6	12″ M. B. Files	2.25
6	14″ F. B. Files	3.99
6	14″ Half Round Bastard Files	4.65
6	6″ S. T. Files	0.95
12	5″ Hay Fork Pulleys	9.00
2	Hot Splitting Chisels	3.24
6	24″ Hot Splitting Chisel Handles	0.72
2	16 lb. Crow Bars	3.68
1	100′ Steel Tape	8.75
2	3″ Elliptic Flue Cleaners	4.20
2	No. 4 Zinc Oilers	0.75
1	100 lb. Bale White Waste	21.00
4	5 lb. Cans Cup Grease	4.30
1	No. 33 Portable Blacksmith Forge	35.00
1	Bbl. Steam Engine Oil	34.84
¼	Bbl. Steam Engine Oil	18.00
1	28″ Single Sheave Pulley Block	97.50
1	28″ Double Sheave Pulley Block	135.00
1	28″ Triple Sheave Pulley Block	172.50
1	12″ Telegraph Wheel	1.25
1	150′ Telegraph Cord	0.62
1	No. 14 Belt Punch	0.51
3	Prs. 12″ Belt Clamps	3.24
80′	⅜″ Pipe for Reverse Lever	3.19
12	2″ Malleable Ells	4.80
12	1″ Malleable Ells	2.11
12	½″ Malleable Ells	0.96
12	2″ Malleable Tees	5.76
12	½″ Malleable Tees	1.06
36	2″ Assorted Nipples	8.00
36	1″ Assorted Nipples	4.00
24	½″ Assorted Nipples	2.00
12	2½″ Plugs	1.73
12	each 2″, 1″ and ½″ Lip Unions	39.60
6	2″x1″ Bushings	0.71
6	C. C. Std. Flange Unions	7.56
12	each 2″, 1″ and ½″ Globe Valves	97.20
6	each 2″ and 1″ Stop Cocks	115.20
400′	2″ Black Steam Pipe, 1200 lb. test	88.80
100′	1″ Black Merchant Pipe	20.40
100′	½″ Black Merchant Pipe	5.34
12	2″ C. I. Tees	3.94
12	2″ C. I. Plugs	0.96
12	1″ C. I. Plugs	0.38

(All above material f. o. b. Ranger, Texas.)

1	Rotary complete, with Drive Bushing and Slips for 4″ Drill Pipe	1,395.00
1	Draw Works complete, with Asbestos Lagged Brake Band	1,448.75
2	3″ Swivels	600.00
2	Sections 2″x32′ Rotary Hose	134.40
2	Sets 2″ Hose Clamps and Nozzles	22.26
2	10x5¾x12″ Slush Pumps, $700 each	1,400.00
1	Set Manifold Fittings complete, less suction pipe	100.00
1	Set 4″ 1¾x36″ Elevators	127.05
1	Set 6″ 1¾x36″ Elevators	150.15

(All above material f. o. b. Houston, Texas.)

1	5½″x29′ Quadruple "V" Grooved Stem, complete with Upper and Lower Couplings	695.00
2	4x4x36″ Drill Collar—taper Joint	104.00
2	6x6x36″ Drill Collar—taper Joint	162.50
2	22″ Tool Steel Fishtail Bits 5x6 4-Pin—per pound net	.45
2	20″ Tool Steel Fishtail Bits 5x6 4-Pin—per pound net	.45
4	17″ Tool Steel Fishtail Bits 5x6 4-Pin—per pound net	.45
4	15″ Tool Steel Fishtail Bits 5x6 4-Pin—per pound net	.45
4	12″ Tool Steel Fishtail Bits 5x6 4-Pin—per pound net	.45
6	9⅞″ Tool Steel Fishtail Bits 5x6 4-Pin—per pound net	.45
6	9⅞″ Tool Steel Fishtail Bits 3¼x4¼″ 6-Pin—per pound net	.45
6	5⅞″ Tool Steel Fishtail Bits 3¼x4¼″ 6-Pin—per pound net	.45
6	7⅞″ Tool Steel Fishtail Bits 3¼x4¼″ 6-Pin—per pound net	.45
1	2″x7′6″ Temper Screws with "T" Head, less clamps	144.00
1	Set 1″ Wire Rope Clamps	48.00
1	Set 2¼″ Manila Rope Clamps	48.00
1	Set 2″ Inserted Temper Screw Slips	15.00
1	10″ Slip Sockets 2¾x3¾″-7-4″ Sq. with 2 extra sets slips, bore 7⅛″	160.88
1	12½″ Bowl for same	37.95
1	15½ Bowl for same	37.95
1	8″ Slip Socket 2¾x3¾″-7-4″ Sq. with 2 extra sets slips bore 6⅝″	165.00
1	6¼″ Combination Socket 2¾x3¾″-7-4″ Sq. with 2 extra sets slips	86.63
1	8″ Bowl for same	37.95
1	8″ Center Rope Spear 2¾x3¾″-7-4″ Sq.	71.78
1	6¼″ Latch Jack 2¾x3¾″-7-4″ Sq.	47.03
1	8″ Comb. Steel Nipple	75.00
1	Set 5″ Sq. 350-lb. Tool Wrenches with 4″ Liners 450 lbs.	146.25
1	4x4x12″ T. B. Derrick Crane	85.00
1	Clevis Pulley & Clevis	12.00
1	Manila Rope Spudding Shoe and Ring	12.25

(Continued on page 180.)

Here's What "John Crane" Has *Done!*

CRUDE OIL—Gates, Texas: Pipe line plunger packed five years and still operating.

COLD WATER—Houston, Texas: Municipal pumping plant's 20-inch plungers packed 3 years and still operating.

HOT WATER—Chicago, Illinois: Boiler feed pumps packed eight years ago and still operating.

STEAM—U. S. Navy specifies "JOHN CRANE" for high and low pressure service.

CENTRIFUGAL—Chicago, Illinois: Pumping station centrifugal packed three years ago and still operating.

TURBINES—"JOHN CRANE" is standard equipment on Carling & Wing turbines.

AIR, HIGH PRESSURE—U. S. Navy: Installation at large submarine base giving excellent results.

HOT OIL—Houston, Texas: Battery of eight pumps on still bottoms packed since initial run of refinery nine months ago, and still operating.

AIR, LOW PRESSURE—Olds Motor Works: Compressors packed four years ago and still operating.

AQUA AMMONIA—Baton Rouge, Louisiana: Large pumps packed two years and still operating.

ANHYDROUS AMMONIA—St. Paul, Minnesota: 16x36-inch Vilter packed with "JOHN CRANE" more than six years ago and still operating.

ACIDS—Houston, Texas: Two acid pumps packed at initial run of refinery nine months ago and still operating.

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W. H. Steigerwald Co., Inc..Houston, Texas
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Alamo Iron Works.....San Antonio, Texas
Edward Soph Company.....Tulsa, Okla.
General Mach. & Supply Co...Tampico, Mex.

Pacific Mill & Mine Supply Co.
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Pacific Mill & Mine Supply Co.
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Associated Supply Co...San Francisco, Calif.
Associated Supply Co.....Los Angeles, Calif.

Associated Supply Co.....Bakersfield, Calif.
Associated Supply Co.....Fellows, Calif.
Western Belting & Packing Co..Denver, Colo.
Crane & Ordway Co.....Great Falls, Mont.
Crane & Ordway Co.....Billings, Mont.
C. T. Patterson Company...New Orleans, La.

DOYLINE LU

Shreveport, Louisiana

We Meet the Demands of the Situation

The philosopher remarked "Nothing is certain but death." But even in those ancient times, the chances of living a long and useful life were ten times greater than at present. Nowadays nothing is certain but death and—car shortage, and of the two, the latter is bound to strike first, and if it doesn't get you the first lick, it'll come again—only this time it's worse.

Now, we knew it would be that way, and we have therefore done everything under God's sun we could to prepare for it and meet the demands of the situation, and if anybody

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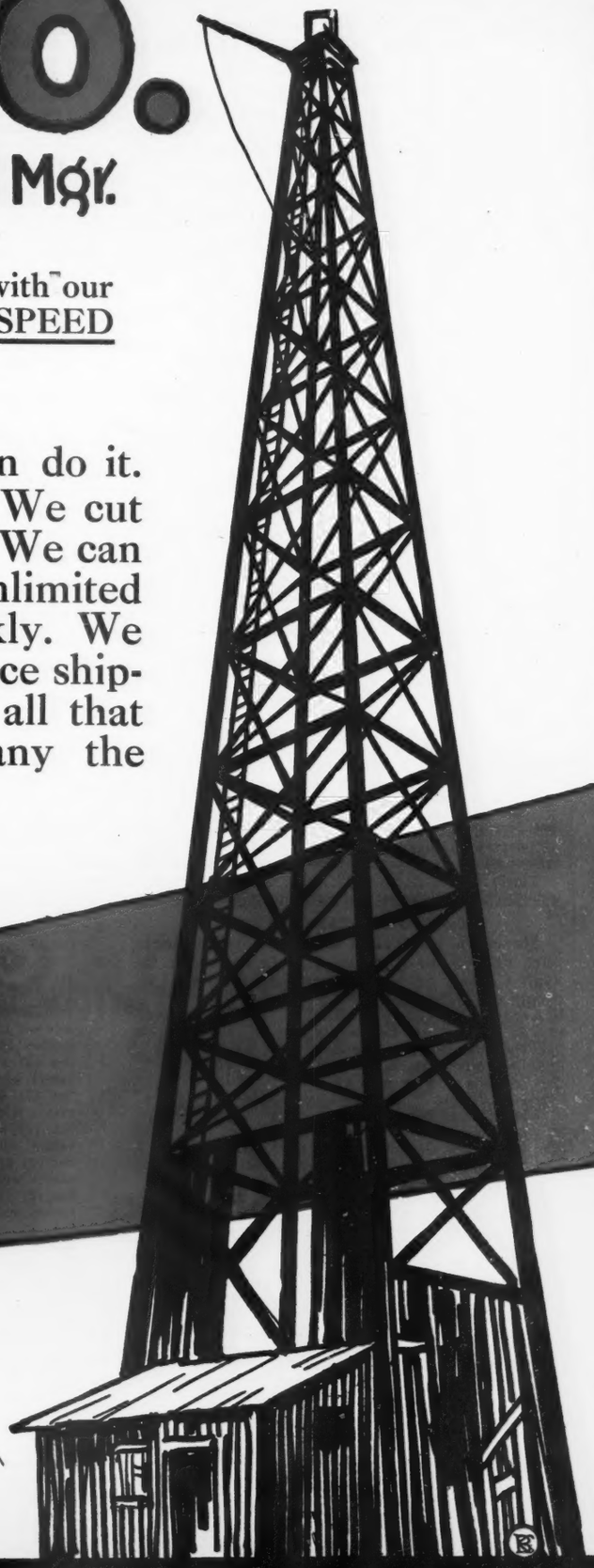


PECIALIZE

MBER & TIMBERS

COST OF DRILLING WELLS IS SHOWN FOR SEVERAL FIELDS

(Continued from page 176.)

COMBINATION OUTFIT—Continued

1	18″x6′ Drill Bits 5″ Sq. 4x5-7 approximate weight 1575 pounds	297.68
2	16″x7′ Drill Bits 5″ Sq. 4x5-7 approximate weight 3024 pounds	571.54
2	12½″x7′ Drill Bits 5″ Sq. 4x5-7 approximate weight 2600 pounds	491.40
2	10″x7′ Drill Bits 5″ Sq. 4x5-7 approximate weight 1930 pounds	364.77
1	5¼″30′ Auger Stem Box 4″x5″-7-5″ Sq. Pin 3¼x4¼″-7	255.20
1	Set 6½″x8″ Stroke Jars 3¼x4¼″-7-5″ Sq..	232.75
1	6¼″ New Era Rope Socket 3¼x4¼″-7-5″ Sq.	68.60
1	6½″ Solid Wire Rope Socket 3¼x4¼″-7-5″ Sq.	46.95
1	6½″x1″ Swivel Wire Rope Socket 3¼x-4¼″-7-5″ Sq.	115.00
1	14″x16′ Ball and Dart Bailer	292.50
1	11″x20′ Ball and Dart Bailer	175.50
1	8″x25′ Ball and Dart	146.25
1	7″x30′ Ball and Dart Bailer	130.00
1	5¼″x30′ Ball and Dart Bailer	104.00
2	8″x7′ Drill Bits 3¼x4¼″-7-5″ Sq. approximate weight 1130 pounds	215.57
1	5″x32′ Auger Stem Box 3¼x4¼″-7-5″ Sq..	232.00
1	5½″x4½″ Stroke Drilling Jars 2¾x3¾″ 7-4″ Sq.	152.95
1	5½″x36″ Fishing Jars 3¾x4¾″-7-4″ Sq...	182.88
1	5½″ Rope Socket 2¾x3¾″-7-4″ Sq.	51.10
1	5½″ Solid Wire Rope Socket 2¾x3¾″-7-4″ Sq.	36.40
1	5½″ Swivel Wire Line Socket 2¾x3¾″-7-4″ Sq.	90.00
2	6⅝″x7′6″ Drill Bits 3¾x3¾″-7-4″ Sq. approximate weight 910 pounds	171.99
1	Set 5″ Sq. 6x6″x22″ Material Drive Clamps with 3″ Bolts and Nuts	77.20
1	Set 4″ Sq. 5x5x20″ Material Drive Clamps with 3″ Bolts and Nuts	53.20
1	18″ Bit Gauge	6.80
1	15½″ Bit Gauge	5.20
1	12¼″ Bit Gauge	4.48
1	10″ Bit Gauge	3.84
1	8¼″ Bit Gauge	3.20
1	6⅜″ Bit Gauge	2.88
	Total	$25,660.93

(All above material f. o. b. Chattanooga.)

COST OF ROTARY OUTFIT

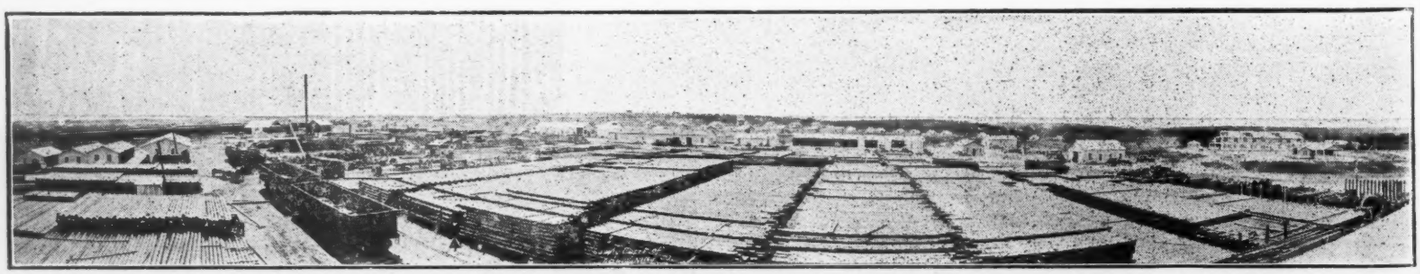
Herewith is given a complete list of tools, etc., needed for a rotary drilling outfit for the Gulf Coastal fields together with their cost on September 25, 1920:

Quantity	Article	Cost
1	50 Horse Power Locomotive type oil country Boiler, complete with 26″ dia. by 26′ Long Smoke Stack, 100′ ¼″ Guy Wire with reg. box of fittings as follows: 1 3″ Nipple 3″ long; 2 1¼″ Nipple 3½″ long; 1 ¼″ Nipple 4″ long; 2 1¼″ Nipple 24″ long; 1 3x2x3″ Tee; 1 ¼″ Elbow; 1 ¼″ Steam Gauge Syphon; 1 2″ Br. Pop Safety Valve; 3 ½″ Ball Gauge Cocks; 2 ½″ Water Gauge Comp. with Glass and Rod; 1 5″ Steam Gauge; 1 1¼″ Asb. Blow-off Cock; 1 1¼″ Steam Cocks; 1 Box containing 12 Hand Hole Plates, Arches and Gaskets	1,734.00
1	1¼″ D. D. Penberthy Injector	27.00
1	Oil Burner	8.25
1	3″ Flue Cleaner	3.00
1	1½″ Asbestos Iron Packed Cock	6.40
1	1½″ K. W. 115 Volts, 2600 R. P. M. Generator, comp. with wiring and lamps as follows: 400′ No. 12 Weatherproof Wire; 100′ No. 14 Weatherproof Wire; 10 Weatherproof Sockets; 8 40 Watt Mazda Lamps; 2 60 Watt Mazda Lamps; 25 Por. Knobs and Screws; 10 Lamp Guards; 1 No. 1695 Cut-out; 12 12-ampere Fuse Plugs; 1 Roll Friction Tape	294.00
1	6x4x6″ Boiler Feed and General Service, Brass or Steel Fitted Pump	275.00
1	11½″x12″ 28 Horse Power Steam Drilling Engine, Belt Pulley, fitted with Engine Sprocket for 1030 Chain and with 2-Quart Lubricator, Box Fittings, and exhaust pipe	588.85
1	A-Semi-Steel Rotary, complete with Steel Drive Bushing, Hardened Lugs, Steel Spider, 4″ and 6″ slips	1,395.00
1	Set 3″ Slips	110.00
1	5″-5½″x28, Quadruple "V" Grooved Grief Stem complete with Upper Collar and Lower Bushing	665.00
1	BC Draw Works complete, with 5″ Drum, fitted with 27-tooth, No. 1240 Chain Steel Bronzed Bushed Drum Drive Sprocket, 18-tooth No. 1240 Chain, Bronze Bushed Quick Hoist Sprocket, 36″ Cast Iron Drum Flanges, Babbited Bearing Boxes, 3-15/16″ x12′ Line Shaft with 36-tooth No. 1030 Chain, Bronzed Bushed, Rotary Drive Clutch Sprocket, 11-tooth, No. 1240 Chain Drum Drive Sprocket, 18-tooth, No. 1240 Chain Bronzed Bushed Quick Hoist Sprocket, and 15-tooth, No. 1240 Chain Engine Sprocket, all Engine Sprockets closely fitted and keyed to the shaft, and with quick hoist attachments, Foot Pedals, Rotary Clutch, Oak Posts, 8″ Double Brake Bands and 1″x7″x16′ Asbestos Brake Band Lagging	1,448.75
1	8″-10″ "I" Beam 20″ 5-Pulley Crown Block with Babbitted Bearing Boxes, complete	150.00
1	3-4 Sheave 48″ 26″ O. D. Sheave, Traveling Block, complete, Sheaves Bronze Bushed (Note—If contemplating drilling beyond 3500 feet, 4-sheave block is recommended.)	380.00
1	4″-4½″ Strapped "C" Hooks	49.50
1	4½″-5″ Double Swivel Hook	102.20
2	3″-4″ Cone Bearing Swivel, complete, $300.00	600.00
2	10″x5¾″x12″ Slush Pumps, with Steam and Water Ends, and Rocker Stand, $700.00	1,400.00
2	2″x32′-2½x32′ Wire Wound Rotary Hose, $67.20	134.40
2	2″-2½″ Sets Hose Clamps and Nozzles, $11.10	22.20
1	1″x25′ 4-ply Water Hose	11.50
1	½″x25′ 4-ply Steam Hose	9.80
	30′ No. 1240 Chabelco Chain	127.50
	60′ No. 1030 Chabelco Chain	121.50
1	Set (2) 3″ Fairs-Mannington Heavy Elevators with 1¾″x36″ Bails	112.50
1	Set (2) 4″ Fairs-Mannington Heavy Elevators with 1¾″x36″ Bails	123.75
1	Set (2) 6″ Fairs-Mannington Heavy Elevators with 1¾″x36″ Bails	146.25
1	Set (2) 8¼″ Fairs-Mannington Heavy Elevators with 1¾″x36″ Bails	172.50
1	Set (2) 10″ Fairs-Mannington Heavy Elevators with 1¼″36″ Bails	180.00
1	Set (2) 8¼″ Spring Latch Improved Heavy Elevators	275.00
1	Set (2) 10″ Spring Latch Improved Heavy Elevators	341.00
2	Sets (4) 1¾″x36″ Links for Elevators	59.40
1	Pair 6″ Steel Slide Tongs	34.40
1	Pair 8″ Steel Slide Tongs	36.80
1	Pair 10″ Steel Slide Tongs	41.60
1	Tong Handle Steel Slide Tongs	74.25
1	Pair 3″ Pipe Jaws	56.65
1	Pair 4″ Pipe Jaws	56.65
1	Pair 4″ Tool Joint Jaws	56.65
1	Pair 6″ Pipe Jaws	56.65
1	Pair 6″ Tool Joint Jaws	69.63
1	Pair 8¼″ Pipe Jaws	69.63
1	Pair 10″ Pipe Jaws	75.63
1	4x4x18″ Forged Steel Drill Collar	31.90
1	4x4x24″ Forged Steel Drill Collar	37.70
1	6x4x24 Forged Steel Drill Collar	55.10
1	6x4x36 Forged Steel Drill Collar	72.50
2	6″x4″ Forged Steel Bushings	42.00
1	¾″x6x19x1050′ Crucible Cast Steel Drilling Line	174.56
1	⅝″x6x7x3500′ Crucible Cast Steel Sand Line	367.50
6	¾″ Wire Rope Clips	1.37
6	⅝″ Wire Rope Clips	1.16
25	3″x18″ Tool Joints Threaded Water Courses, $36.15	903.75
30	4″x18″ Tool Joints with Threaded Water Courses, $44.05	1,321.50
1	1¼″x250′ Manila Cat Line	33.28
2	16″ Fishtail Bits with 6″ Shank	168.20
2	14″ Fishtail Bits with 4″ Shank	90.00
5	9⅞″ Fishtail Bits with 4″ Shank	160.50
4	8½″ Fishtail Bits with 4″ Shank	104.92
4	7⅞″ Fishtail Bits with 4″ Shank	98.80
6	5⅞″ Fishtail Bits with 4″ Shank	102.60
1	Low Down Pump, threaded for 2″ Pipe Suction and Discharge	16.15

Derrick Tools and Appliances

2	Pairs No. 12 Chain Tongs	10.00
2	Pairs No. 14 Chain Tongs	22.00
1	Pair No. 13 Chain Tongs	7.35
1	Pair No. 13½ Chain Tongs	9.45
2	Pairs No. 15 Chain Tongs	36.00
1	Pair No. 16 Chain Tongs	40.00
4	No. 3 Long Handle Round Point Shovels	6.00
6	36″ Sledge Handles	2.70
1	12-pound Sledge Hammer	2.64
1	14-pound Sledge Hammer	3.08
1	3-pound Ball Hammer	1.85
1	2-pound Ball Hammer	1.40
2	8″ Wrenches	2.40
2	12″ Wrenches	3.60
1	15″ Wrench	2.40
1	18″ Wrench	3.20
1	24″ Wrench	3.09
1	14″ Wrench	1.93
1	36″ Wrench	7.43
1	18″ Wrench	2.75
1	No. 3 Hatchet	2.20
1	7-pt. Hand Saw	3.50
1	4½″ Single Bit and Handle	2.25
1	No. 9 Hack Saw Frame	2.00
12	12″ Hack Saw Blades	1.30
1	6′ Cross Cut Saw	9.85
2	Handles for same	1.00
2	12″ Mill Bastard Files	.79
2	16″ Mill Bastard Files	1.54
1	No. 2 Grease Cup	2.88
1	No. 3 Grease Cup	3.44
1	No. 3 Stock and Die 1″ to 2″	24.50
1	No. 1 Pipe Cutter	1.95
1	No. 2 Pipe Cutter	2.93
2	¾″ Diamond Point Chisels	1.08
2	¾″ Cold Chisels	.90
2	⅞″ Cold Chisels	1.42
1	5-pound Cold Splitting Chisel with Handle	2.75
1	5-pound Hot Splitting Chisel with Handle	2.75
1	3-pound B. S. Flatter	1.26
2	¼″ Hand Punches	.80
2	Pairs 26″ Lip B. S. Tongs	2.90
1	Pair 26″ Curved Lip B. S. Tongs	1.50
1	4-pound B. S. Set Hammer	1.68
1	⅞″ B. S. Top Fuller, 3 pounds	1.24
1	⅞″ B. S. Bottom Fuller, 3 pounds	1.26
2	Pinch Bars	4.92

(Continued on page 184.)



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Electricity Invading Oil Sections

Power Companies Seek to Interest Mexican Officials

By J. F. Carter, Jr.

When water is hard to get, the oil operator who can connect with an electric power is "all jake." And from the way electric companies are invading the different oil sections, it won't be long until there will be many a piece of equipment electrically equipped.

Safe lighting is another feature that comes with a distributing electric system.

Many companies throughout Oklahoma and Texas "have seen the light," this time electric light, and are hooking up their own or central power plants. And electrical experts now are trying to interest Mexican officials visiting in Texas. —The Editor.

DALLAS, TEXAS, Oct. 15.—Electricity today is playing an important part in the production and recovery of petroleum in the Southwest. Electrical power and contrivances are boosting production in the fields of Texas, Oklahoma, Louisiana and Kansas, and electrical supply houses are building up a trade that offers possibilities of almost unlimited scope. Electricity truly has invaded the oil fields, and to the extent that only a personal visit to the producing areas can show what remarkable progress and advancement has been made since electric motor propulsion was harnessed by belts to drilling appliances and pumps.

At the Texas State Fair in Dallas this year the electrical exhibit is one of the largest and most complete ever assembled for public inspection. Among the exhibitors are the largest electrical concerns in the country, including the Southwest General Electric Company and the Western Electric Company. Electrical supply houses in Dallas, Fort Worth and in other cities in Texas and Oklahoma have space at the Fair Grounds, and special attention is being given to the possibilities of electrical power for oil field use. It is the desire of the electrical concerns also to interest Mexican officials, who are in Dallas as special guests of the fair management, in electrical power for the development of that country's petroleum resources.

Electricity for Lighting

At first electrical power for drilling operations was tried out on a small scale in Texas. The use of electricity in the fields of Oklahoma was successfully applied prior to the invasion of the industry in Texas. However, the turn of events, inspired by the discovery of oil in paying quantities, did more to encourage the use of electricity in oil field work than did any other one thing, perhaps. Not so long ago the oil and gas division of the Texas Railroad Commission ruled that lighting arrangements at wells and in the oil districts should be so constructed so as not to constitute fire hazards. Electric lighting was acclaimed and proven the least dangerous and the most efficient of all appliances, with the result that today a veritable network of transmission lines are strung out over Central North and West Texas and in parts of Oklahoma, Louisiana and Kansas, carrying power for motors and municipal lighting and drilling and pumping and for manifold other uses common to oil field requirements.

By far the largest project of its kind in the Southwest is the huge electrical plant of the Oil Belt Power Company which has been constructed near Eastland in West Texas. This plant is financed by the General Electric interests, and when in operation will furnish power to virtually all of Central West Texas. In addition to supplying power for drilling and pumping purposes in the oil fields and for lighting at wells and at refinery sites, the Eastland plant will furnish power for domestic and industrial use in the towns of Eastland, Ranger, Cisco, Gorman and Breckenridge, and at other places in the Central West Texas oil territory. The total expenditure of this project will be in the neighborhood of $5,000,000.

Practicing Electrical Economy

Actual demonstration has conclusively proven that electricity is being used for drilling and pumping with a minimum of cost and upkeep. In many sections electrical power is more economical and at times almost the sole means of propulsion, due to the scarcity of water, the cost of upkeep and the pipe line expense connected with other kinds of engines installed to supply power. With transmission lines serving virtually every section, however remote from railroad or postoffice, lighting of wells at night today is simple compared with the crude methods employed in the past. Even in "boom" towns which spring up overnight, enjoy prosperity for a season and then shrink and slowly perish in the sun and dust, municipal lighting problems are solved and while business is good street lights and lights for temporary residences are obtainable at a comparatively small expense.

In Oklahoma the largest motor installation for oil field use is said to be on the Hill lease of the Cosden Oil & Gas Company, near Drumright. Electrical power and electrical appliances more and more are coming into general use in all parts of Oklahoma and Kansas, especially for pumping wells. The Oklahoma Gas & Electric Company is constructing a plant at Jenks, near Tulsa, and distributing stations have been installed in the Cushing field and at Drumright, Beggs, Garber and Covington.

Service Houses Established

Some of the larger oil corporations are supplying their producing areas with electrical power on a large scale. The Prairie Oil & Gas Company in Oklahoma is completing the installation of power near Drumright for the operation of fifteen oil well pumping motors. Other companies are doing this, with the result that electrical supply houses are establishing branch distributing and service stations in towns located in the oil territory from which they draw their trade.

With the cost of fuel of all kinds daily mounting higher and the probability of serious delays in transportation of coal and the obtaining of gas and fuel oil, the use of electricity for pumping and drilling purposes more and more is becoming popular in all sections of the oil territory in the Southwest. And such projects as the Oil Belt Power Company and the Oklahoma Gas & Electric Company are insuring an adequate and continuous supply of energy which now can be sent and applied to wells, pumps and oil field machinery of all kinds at the minimum of cost.

It is the opinion of conservative electrical dealers that the invasion of electricity in the oil fields has just begun. The possibilities of the future present an attractive picture, they say. And with conviction, too.

United States Oil Exports Show Big Gain in 20 Years

A jump from 23,029,809 barrels in 1900 to almost 60,000,000 barrels in 1919, and a possible 70,000,000 barrels in 1920, is the story of United States oil exports during the past 20 years. These figures include exports of all oils and are shown in the table below.

The gain of 1919 over 1900 is a gain of 157 per cent, while the value increased from $75,611,000 to $343,776,385, or 354 per cent. Production in the United States shows a gain of 490 per cent.

Increase in exports is shown in the following table (in barrels):

Year	Exports	Value
1919	59,351,295	$343,776,385
1918	64,633,803	344,265,500
1917	61,830,962	253,021,000
1916	62,082,904	201,721,000
1915	55,445,833	142,941,000
1914	53,334,119	139,900,000
1913	50,868,214	149,316,000
1912	44,844,500	124,210,000
1911	42,112,642	105,922,000
1910	36,811,119	99,090,000
1909	37,182,642	105,999,000
1908	34,369,928	104,116,000
1907	29,938,809	84,855,000
1906	29,951,166	84,041,000
1905	26,746,047	79,793,000
1904	23,438,619	79,060,000
1903	22,421,404	67,253,000
1902	26,338,285	72,302,000
1901	24,634,357	71,112,000
1900	23,029,809	75,611,000

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Read This!!

GLADYS BELL OIL GIVES STATEMENT ON 22-14-11 PRODUCTION

Okmulgee Daily Democrat
Aug. 17-1920.

In view of the conflicting reports that are rife as to the Gladys Belle Oil company's wells in 22-14-11, Fred F. Ford, superintendent of the company, has given the following data as accurate and dependable:

"The Gladys Belle's fat production is coming from an 80-acre tract described as the west half of the northeast quarter 24-14-11. This 80 is still further divided into two forties, the north forty being called the Thornburg Thompson and the south forty the Riley Thompson and the operations began on the Riley Thompson lease and the No. 1 well on this forty has since drilling in April 23, this year, proven a splendid well and still making an average of 1,400 barrels per day. No. 2 well was the one unlucky fly in the ointment,' being a fishing job for 57 days, and was finally abandoned. Another hole for No. 2 is now drilling at 2,400 feet and should be in in a very few days. No. 3 started off with 1,800 barrels and is holding its own at 1,200 today. No. 4 came in with 3,200 barrels and is still making 1,200. No. 5 got the said at 2,765 feet and on August 16 at 16 feet in the sand, was making 50 barrels the hour.

"On the Thornburg Thompson, No. 1 well is filling the tanks at the rate of 900 barrels daily. No. 2 will drill in Tuesday, August 17. No. 3 is drilling at 1,900 feet. [illegible] wells look good. [illegible] universally among [illegible] wells look 1,000 to 2,000 barrels daily [illegible] talent for "The oil is of the best quality [illegible] ch. gagerly sought by refining interests, and ude of 44 gravity is profitable even where refining methods are not of the most efficient.

"As an example of the Gladys Belle's progressivve methods along the line of conservation, the oil from all these producing wells is running through Smith gas separators or gas-traps. These traps take up the excess gas and, as the result, the company is supplying gas-fuel for 12 boilers used in drilling and pumping work. The Smith sepatator seems to be the economical solution of a hitherto dreaded danger in actively worked areas."

Okmulgee Daily Democrat
August 17-1920

SMITH

Oil and Gas Separator

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There are four Smith Separators on the Gladys Belle lease.

They separate and save sufficient gas to operate 12 boilers. In addition to a considerable volume of gas is sold to outsiders.

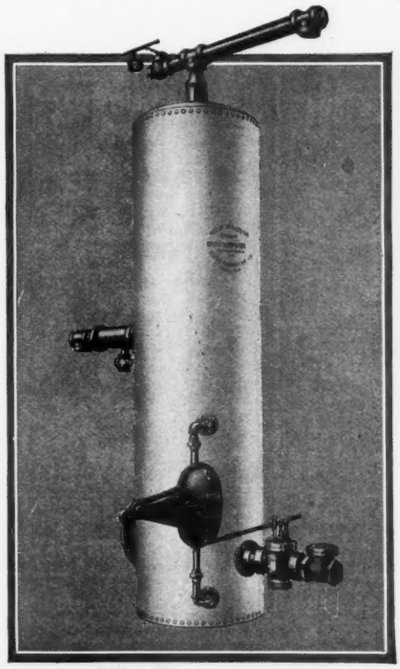
Smith Oil and Gas Separator

pays its way handsomely wherever there is gas. In addition to the money it earns, it is a real protection to any lease—a dependable safeguard against fire and explosion.

Write for catalog describing the various sizes and types.

Smith Separator Co., Inc.

P. O. BOX 1781 TULSA, OKLAHOMA



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R. F. D. ..... Town .....

State .....

The volume of my well per 24 hours is:

Bbls. of Oil ..... Cu. Ft. of Gas .....

COST OF DRILLING WELLS IS SHOWN FOR SEVERAL FIELDS

(Continued from page 180.)

ROTARY OUTFIT—Continued.

1	10″ Drop Link Snatch Block	9.00
1	No. 3 Combination Pipe Vise	32.00
1	150′ Wire Telegraph Cord	.62
	1000′ 2″ Line Pipe	222.00
	500′ 1″ Line Pipe	51.00
	60′ 1¼″ Line Pipe	8.90
	20′ ½″ Black Pipe (For Reverse Pipe)	1.70
6	2″ Iron Body Brass Washer Stop Cock	15.36
6	1″ Iron Body Brass Washer Stop Cock	6.24
12	1″ Globe Valves	23.18
4	1¼″ Globe Valves	11.04
9	2″ Valves	54.34
1	1¼″ Check Valves	2.25
1	2½″ Quick Opening Gate Valves	14.63
2	6″ Cast Iron Foot Valves	14.70
1	2″ Cast Iron Foot Valves	.95
12	2″ Malleable Tees	9.24
12	2″ Malleable Ells	12.25
12	1″ Malleable Ells	2.64
12	1″ Malleable Tees	3.77
12	2″ Cast Iron Ells	3.53
2	3″ Cast Iron Ells	1.58
2	6″ Cast Iron Ells	5.78
4	3″ Cast Iron Tees	4.62
4	6″ Cast Iron Tees	14.80
8	2″ Cast Iron Plugs	.67
8	1″ Cast Iron Plugs	.27
2	3″ Cast Iron Plugs	.42
2	3″ Cast Iron Crosses	4.20
8	1x3″ Black Nipples	.58
12	1x4″ Black Nipples	.87
12	1x6″ Black Nipples	1.21
2	1¼x4″ Black Nipples	.22
2	1½x6″ Black Nipples	.32
6	1x10″ Black Nipples	1.04
2	1x12″ Black Nipples	.40
12	2x4″ Black Nipples	1.81
24	2x6″ Black Nipples	5.11
8	2x8″ Black Nipples	2.42
4	2x10″ Black Nipples	1.46
2	2x12″ Black Nipples	.86
7	2½x8″ Black Nipples	3.80
2	2½x12″ Black Nipples	1.51
6	3x2″ Black Nipples	1.61
2	3x10″ Black Nipples	1.62
2	6x8″ Black Nipples	4.02
2	6x12″ Black Nipples	5.58
2	6x18″ Black Nipples	8.88
1	3x2″ Standard Swedge Nipple	1.54
1	4x3″ Standard Swedge Nipple	2.08
1	2½x2″ Standard Swedge Nipple	1.25
2	4x2½″ Standard Swedge Nipple	4.57
2	4x3x24″ Standard Swedge Nipple	50.00
2	6x4x24″ Standard Swedge Nipple	45.00
12	2x1″ Cast Iron Bushings	1.51
2	1½x1¼″ Cast Iron Bushings	.16
2	1x½″ Malleable Reducers	.30
6	2″ Flange Unions	15.00
6	1″ Lip Unions	4.80
1	3″ Flange Union	4.50
1	25′ Tape Line	2.50
1	100′ Tape Line	5.50
1	No. 3 Steam Blower	34.50
1	2″ Steel Square	2.50
1	Derrick Safety Belt	7.50
1	Spirit Level	2.20
1	Long Spout Oiler	1.00
1	Squirt Can	.55
25	Pounds ⅜″ Hyd. Packing	25.00
100	Pounds ½″ Hyd. Packing	112.00
50	Pounds 1/16″ Red Sheet Packing	25.00
25	Pounds ½″ Sq. Flax Packing	15.00
5	Pounds ⅜″ Sq. Flax Packing	3.00
5	Pounds ¼″ Sq. Flax Packing	3.00
10	Pounds 1/16″ C. I. Sheet Packing	4.00
5	Pounds ¼″ Spiral Sheet Packing	4.00
14	Pounds ¼″ Dia. Steam Packing	14.75
3	Pounds 3x4″ Hand Hole Gaskets	3.36
2	lbs. Rubber Piston Rod Rings, 2¼x1¼x½″	2.40

Spare Parts for Slush Pump

50	Hydraulic Inserts tor Pump	15.00
16	Ring Valve Seats	40.00
16	Valves, complete, with Hydraulic Inserts	80.00
4	W. E. Piston Rods 5¾″	24.00
2	S. E. Piston Rods 5¾″	12.00
16	W. E. Heads 5¾″	56.00
16	Followers 5¾″	36.00
8	Liners 5¾″	96.00

Spare Parts for Swivel

1	Set ⅝″ Steel Bearings	7.50
2	Outer Ball Races	6.80
1	Inner Ball Races	5.60

Fishing Tools

1	4″Wash Down Trip Spear	138.75
1	6″ Wash Down Trip Spear	176.25
1	4″ Forged Steel Die Nipple Male and Female	15.00
1	6″ Forged Steel Die Nipple, Male and Female	18.75
1	Tool Steel Extra Strong Tool Joint Fishing Tap to catch 6″ Tool Joints with I. D. of hole from 3½″ and up; threaded to connect with 6″-8″ Thread Pipe	160.00
1	Tool Steel Extra Strong Tool Joint Fishing Tap to catch 4″ Tool Joints with I. D. of hole from 2½″ and up; threaded to connect 4″-8″ Thread Pipe	112.50
	Total	$17,713.76

COST FOR STANDARD RIG

Herewith is given a complete list of tools, and equipment needed for a standard drilling rig together with their cost on September 25, 1920:

1	Set 6″ 7′6″ Superior Rig Irons complete with Calf Wheel attachments, 5″x9′ D. D. Sand Reel 12″x42″ Web Friction, Wheel and Boiler Plate Flanges, Guy Wire, Nails, Bolts, and Washers and 55′ No. 1030 Sprocket Chain	1,775.00
1	40 H. P. Locomotive Type Oil Boiler with Guy Wire, Stack, Fittings, and Grate Bars	1,615.00
1	Oil Burner	8.25
1	1″ Regulator less Low Water Alarm	28.00
2	3″ Elliptic Flue Cleaners	6.00
1	12x12″ Oil Country Drilling Engine with Crosshead Pump, Heater, and Extra Balance Rim	719.00
1	12″ Telegraph Wheel	1.19
1	150′ Telegraph Cord	.65
80′	⅜″ Pipe for Reverse Lever	3.19
1	6x4x6 General Service Steam Pump	275.00
1	1½ K. W. Electric Generator with Lamps and Wiring	294.00
1	12″x7-plyx90′ Stitched Rubber Belt	253.89
1	No. 14 Belt Punch	.75
1	12″ 7-pulley Steel Crown Block comp	680.50
2	Pairs 12″ Belt Clamps	1.80
1	⅞″x4000′ 6x19 Steel Drilling Line, Crucible Steel	870.00
1	9/16″x4000′ 6x7 Steel Sand Line	330.00
1	⅞″x850′ 6x19 Casing Lines Steel	168.30
2	2¼″x90′ Manila Bull Ropes	90.00
1	2¼″ 1600′ Manila Drilling Cable	755.00
1	36″ 2150 pounds 3-Sheave Casing Block	280.00
1	5″ 3600 pounds D. S. Drilling Hook	125.75
1	2″x7′6″ Improved Temper Screw with "T" Head less Clamps	144.00
1	Set 2″ Inserted Temper Screw Slips	13.00
1	18″x6′ R. B. M. H. Drill Bits 5″ Sq. 4x5-7	324.00
2	16″x7′ R. B. M. H. Drill Bits 5″ Sq. 4x5-7	612.36
2	12¼″x7′ R. B. M. H. Drill Bits 5″ Sq. 4x5-7	526.50
2	8″x7′ R. B. M. H. Drill Bits 3¼x4¼-7-5″ Sq. 4x5-7	228.83
1	6⅝″x7′6″ R. H. Drill Bit 2¾x3¾″-7-4″ Sq.	92.14
1	Set 5″ Sq. 350-pound Tool Wrenches with 4″ Liners	146.25
1	18″ Bit Gauge	6.80
1	15½″ Bit Gauge	5.20
1	12½″ Bit Gauge	4.48
1	10″ Bit Gauge	3.84
1	8¼″ Bit Gauge	3.20
1	6⅝″ Bit Gauge	2.88
1	5¼″x30′ Auger Stem Box 4x5″-7-5″ Sq. Pin 2¾″x4¼″-7	255.20
1	5″x32′ Auger Stem Box 3¼x4¼″-7-5″ Sq. Pin 2¾″x3¾″-7	252.00
1	4½x36′ Auger Stem 2¾x3¾″-7 Box and Pin	208.00
1	5½″x4½″ Stroke Drilling Jars, 2¾x3¾″-7-4″ Sq.	202.83
1	Set 6½″x8″ Stroke Jars, 3¼x3¼″-7-5″ Sq.	252.75
1	14″x16′ Ball and Dart Bailer	325.00
1	11″x25′ Ball and Dart	204.75
1	9″x25′ Ball and Dart Bailer	146.25
1	7″x30′ Ball and Dart Bailer	130.00
1	5½x30′ Ball and Dart	104.00
1	15½ Spider and Slips for 15½″, 12½″, with liners and slips for 10″, 8¼″ and 6⅝″	689.00
1	Set 15½″ Elevators 2½″x44″	615.00
1	Set 12½″ Elevators 2½″x44″	495.00
1	Set 10″ Elevators 2¼″x36″	419.10
1	Set 8¼″ Elevators 2″x36″	341.00
1	Set 6⅝″ Elevators	324.50
1	10″ Slips Sockets 2¾x3¾-7-4″ Sq. with 2 extra sets slips, bore 7⅛″	204.00
1	12½″ Bowl for same	23.20
1	15½ Bowl for same	33.50
1	8″ Slip Socket 2¾x3¾″-7-4″ Sq. with 2 extra set slips, bore 6⅝″	160.00
1	6¼″ Comb. Socket 2¾x3¾″-7-4″ Sq. with 2 extra slips	84.00
1	8″ Bowl for same	22.50
1	Tong Handle	74.25
1	15½″ Tong Jaw	97.68
1	10″ Tong Jaw	75.63
1	8¼″ Tong Jaw	69.63
1	6⅝″ Tong Jaw	56.65
1	No. 2 Barrett Jack and Circle complete	123.00
1	Set Back-up Tongs	90.00
1	6½″ Rope Socket 3¼x4¼″-7-5″ Sq.	68.60
1	6½ Solid Wire Rope Socket 2¼x4¼-7-5″ Sq.	46.90
1	6¼″x1″ Swivel Wire Rope Socket 3¼x4¼″-7-5″ Sq.	115.00
1	5¾″x36′ Stroke Fishing Jars 2¼x3¼″-7-4″ Sq.	182.88
1	5½″ New Era Rope Socket 2¾x3¾″-7-4″ Sq.	51.10
1	5½″ Solid Wire Rope Socket 2¾x3¾″-7-4 Sq.	36.40
1	5½″ Swivel Wire Line Socket 2½x3½″-7-4″ Sq.	90.00
1	8″ Center Rope Spear 2¾x3¾″-7-4″ Sq.	71.78
1	6¾″ Latch Jack 2¾x3¾″-7-4″ Sq.	47.03
1	Manila Rope Spudding Shoe and Ring	11.90
1	Set 5″ Sq. 6″x22″ Material Drive Clamps with 3″ Belts and Nuts	77.20
1	Set 4″ Sq. 5x5x20″ Material Drive Clamps with 3″ Belts and Nuts	53.20
1	4x4x12″ Derrick Crane	93.50
1	Clevis Pulley and Clevis	11.65
1	Front and Rear Casing Wagon (per set)	40.00
1	1½ Ton Chain Hoist	56.00
1	300-pound Bit Ram	54.00
1	Pattern Tool Box	63.00
1	300-pound Arch Anvil	75.00
1	Set 2½″ Manila Rope Clamps	48.00
12	2″ Malleable Ells	4.20
12	1″ Malleable Ells	2.10
12	½″ Malleable Ells	.84
12	2″ Malleable Tees	5.04
12	1″ Malleable Tees	2.10
1	Set 1″ Wire Rope Clamps	48.00
1	Set Wire Rope Clamps	85.00
12	½″ Malleable Tees	.84
36	2″ Assorted Nipples	6.40
36	1″ Assorted Nipples	3.00
24	½″ Assorted Nipples	1.33
12	Each 2″, 1″, and ½″ Lip Unions, brass to iron seats	39.60
6	2″x1″ Bushings	.66
6	2″ O. C. Standard Flange Unions	7.80
6	each 2″, 1″, ½″ Globe Valves	48.60
6	2″, and 1″ Stop Cocks	21.50
400′	2″ Black Steam Pipe, 1200-pound test	88.80
200′	1″ Black Merchant Pipe	20.40
100′	½″ Black Merchant Pipe	5.34

Derrick Tools and Appliances

1	Wrench 15″	2.40
1	Wrench 18″	3.20
1	18″ Wrench	2.75
2	14″ Wrenches	3.85
2	24″ Wrenches	7.98
2	36″ Sledge Handles	2.70
2	16-pound C. P. Hammers	2.40
2	Long Handle Round Pointed Shovels	3.60
1	7-pointed Hand Saw	3.10
1	12″ Ratchet Brace	3.15
1	24″ Carpenter Steel Square	2.20
2	1″ Hand Cold Chisels	2.50
2	1″ Cape Cold Chisels	2.30
1	20″ S. L. Blacksmith Tongs	1.50
1	20″ C. L. Blacksmith Tongs	1.50
1	Derrick Hatchet	2.25
1	Single Bit Axe and Handle	2.30
2	3-pound Ball Pein Hammers	3.20
1	No. 1-A Stock and Die 1″ to 2″	4.00
1	No. 2 Three Wheel Pipe Cutter	4.00
6	Extra Wheel for same	1.20
1	No. 3 Comb. Bench and Pipe Vise	33.00
1	10″ Iron Snatch Block	9.00
1	No. 9 Star Hack Saw	2.30
1	Dozen 12″ Hack Saw Blades	1.30
1	⅞″x18″ Ship Auger	3.75
1	1″x18″ Ship Auger	4.50
100	Pound No. 4 Babbitt	21.00
1	6″ Babbitt Ladle	2.10
25	Pound 1/16″ Red Sheet Packing	11.50
2	12″ M. B. Files	1.00
6	14″ F. B. Files	5.20
2	14″ Half Round B. Files	6.45
6	6″ S. T. Files	1.40
12	5″ Hay Fork Pulley	9.00
1	4 lb. Hot Splitting Chisel and 1 cold cut	2.00
6	24″ Chisel Handles	1.50
1	100′ Steel Tape	8.00
2	No. 4 Zinc Oilers	2.30
1	No. 33 Portable Blacksmith Forge	36.00
1	28″ Single Sheave Pulley Block	97.50
1	28″ Double Sheave Pulley Block	135.00
1	28″ Triple Sheave Pulley Block	172.50
	Total	$18,790.24

Its Uniform Discharge enables the

ALDRICH QUINTUPLEX LINE PUMP

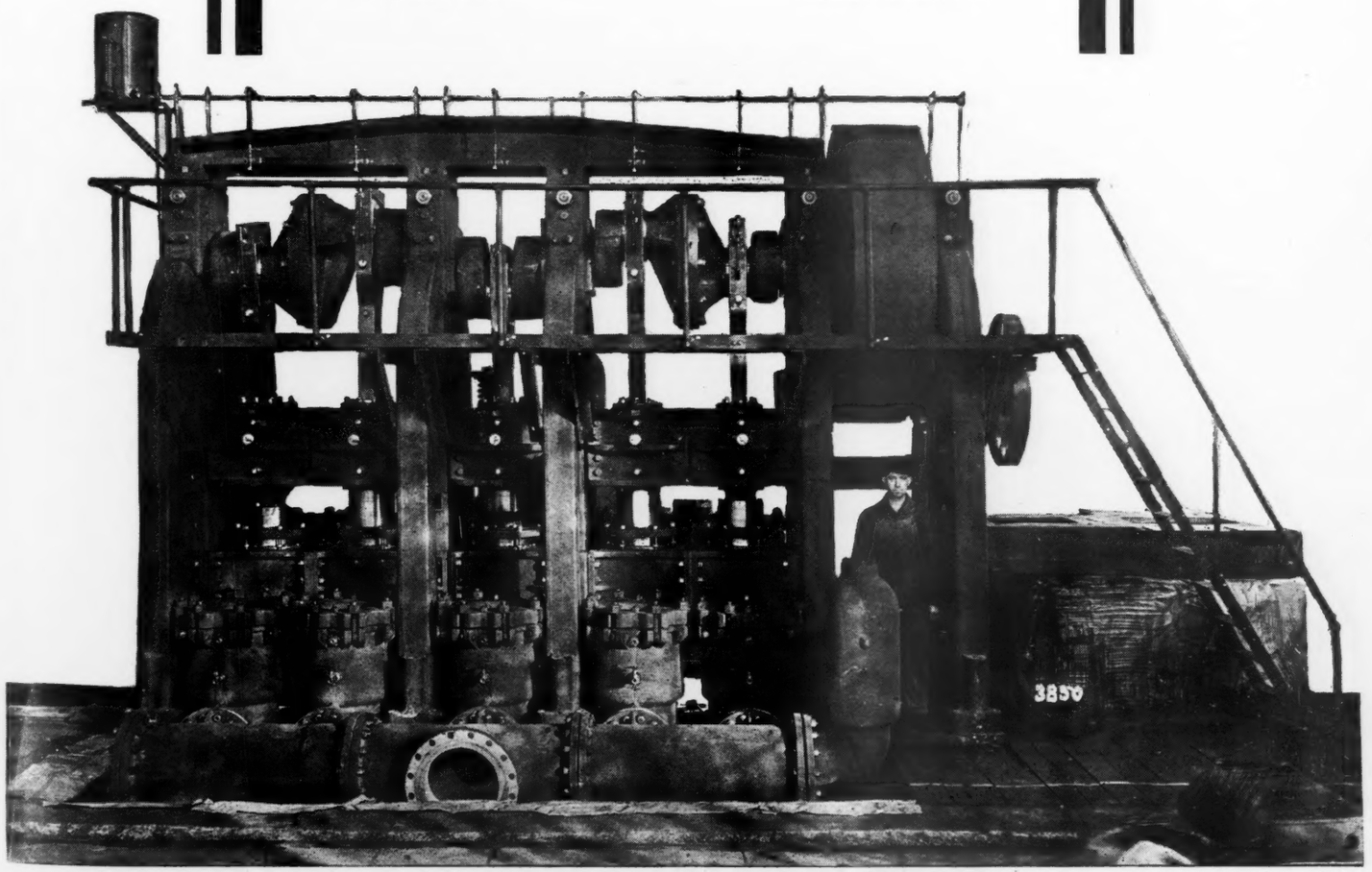
to pump more oil thru the line—and for less money!

There is only 7% total variation in the discharge of the Aldrich Quintuplex. The delivery through the line is approximately 4% of the line's theoretical capacity.

The unnecessary variations in the velocity above or below the mean are what cause the wasteful friction in oil line pumping. The uniformity of the Aldrich Quintuplex's discharge avoids this friction.

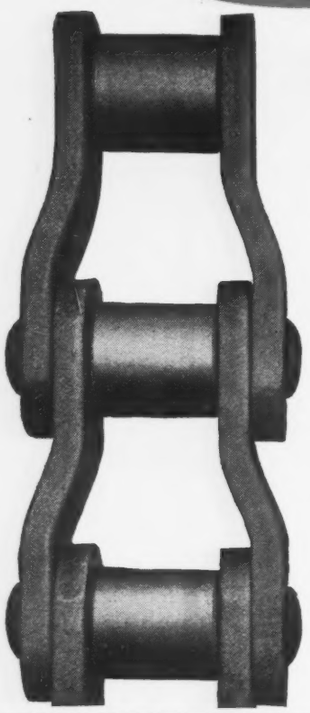
Even distribution of the strain on the working parts and uniform demand on the motive power assure smooth operation, long life and low operating costs when the Aldrich Horizontal Quintuplex Oil Line Pump is used.

THE ALDRICH PUMP COMPANY
P. O. Box 345 ALLENTOWN, PA.



Say you saw it in THE OIL WEEKLY

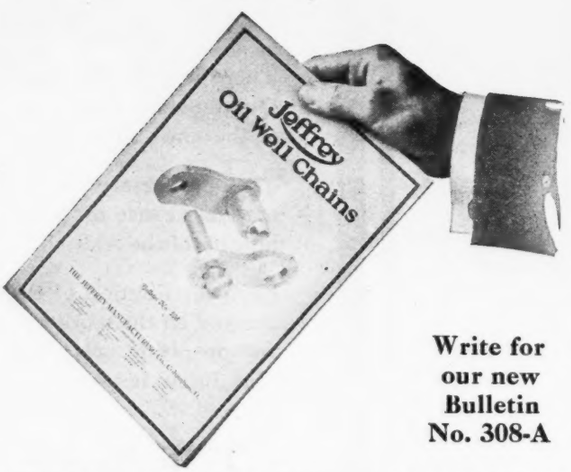
Jeffrey Oil Well Chains
SS-40 and SS-124



Are Proved-In-Service Chains for Economical Oil Well Drilling

Wearing parts are specially Heat Treated. Side Bars are of High Carbon Steel, Strong and Durable. Square Shank underneath the head of pin insures rigid holding of pin in side bar.

Large Stocks Always Available



The Jeffrey Mfg. Co.
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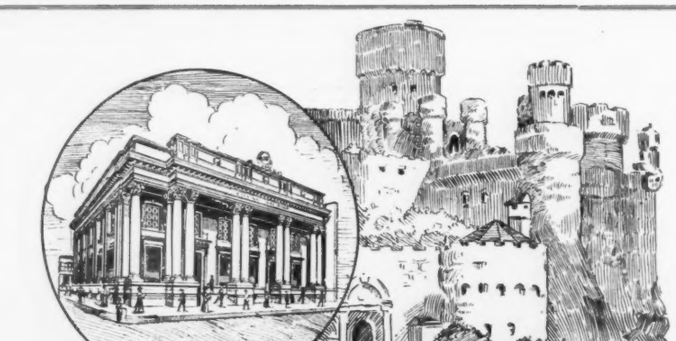
Write for our new Bulletin No. 308-A



STRENGTH PROTECTION

NO INFLUENCE comforts the business man more than implicit confidence in the persons and institutions with whom he deals. Without it, he is harassed by a thousand fears and worries; faith brings serenity — courage — hope — the will to achieve. For two score years and seven this bank has builded confidence in the hearts of its customers — confidence born of the absolute knowledge that they can trust the *Word*, the *Spirit* and the *Service* through which the bank reveals its straightforward purposes.

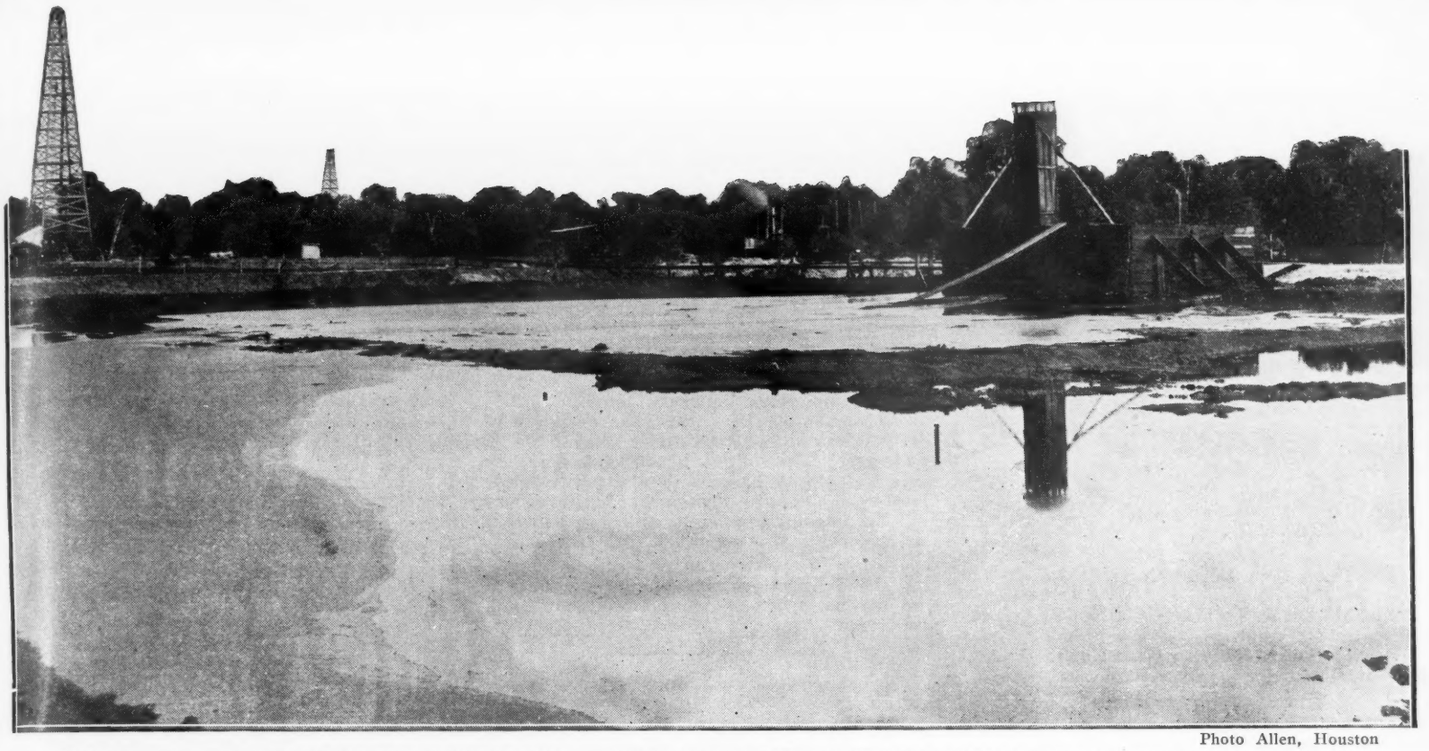


Photo Allen, Houston

FLOW PIT OF THE TEXAS COMPANY'S ABRAMS NO. 1, WHICH HAS SET NEW AMERICAN RECORD FOR ONE-WELL PRODUCTION

West Columbia May Set New Record

Likely that production per acre in this field will exceed the 141,000-barrel mark established in Spindle Top

WEST COLUMBIA, TEXAS coastal field which has held the limelight of Southwestern oil development for the past several months, gives promise of breaking the already-high recovery per acre record for Gulf coastal fields. Figures compiled recently show Spindle Top at the head of this list with an average production per acre of 141,598 barrels. West Columbia, where real development began less than two years ago, promises to eclipse this record as its recovery per acre tops the 150,000 barrel mark at this time.

The most notable American well of the year was brought in at West Columbia.

On July 20th at 7 o'clock in the morning The Texas Company's first well on the Abrams lease, about a mile from the proven field of West Columbia came in at around 2780 feet making between 20,000 and 30,000 barrels of pipe line oil. The flow continued for several weeks, each day's production totaling more than 25,000 barrels. In fact it was the second week in September before the well dropped below that mark.

Then it continued for weeks at a daily mark ranging between 7500 and 10,000 barrels. And at the end of 76 days, this Wonder Well had produced 1,275,000 barrels of oil, possibly the greatest flow from a single American well in such a period of time and certainly a production worth more in dollars and cents than the out-pourings of any other well in America in the same length of time. Value of this amount of oil at $3 a barrel, the prevailing price of crude, is $3,825,000. And this from one well in less than three months!

A. Beeby Thompson in his book dealing with petroleum mentioned a well in the Jennings pool in Louisiana which gave 1,275,000 barrels of oil in four months. The Abrams 1 touched this record in five-eighths of the time required by the Louisiana well which was brought in in 1904. And the best part of it all, the West Columbia well still is flowing.

One month before The Texas Company's Abrams No. 1 blew in, screen was set and the well tested salt water. Packer was drilled out but one joint of four-inch remained in the hole. This length was sidetracked at between 2500 feet where the eight-inch casing ended and the 2600 foot depth. The operators were going ahead and had more than 250 feet of open hole when a hard rock was struck. This was penetrated by the rock bit and pay sand was hit below. The bit remained in the pay.

Production at between 20,000 and 30,000 barrels daily began immediately, the oil, supposedly, coming from below the rock.

The drill stem and the bit remained in the hole, the bit being just below the rock which it had penetrated before pay was hit. However, no flow was allowed through the stem itself, as a cap was screwed on the upper end. A valve was placed on the end of the casing and a cement dome and dirt mound was built above the hole.

When production ceased temporarily early in September it was evident that the open hole had in some way been closed, possibly due to a cave in at some point between the eight-inch and the rock formation below. Then it was that the cap at the end of the drill stem was removed and production began at the rate of 10,000 barrels daily. Two five-eighths inch holes in the bit, it is thought, furnish the "intake" for the oil which is now flowing through the drill stem. Thus it is said that had the drill stem not remained in the hole and the bit below the rock formation, the well possibly would have sanded up more than a month ago.

Immediately after the Texas Company's well came into being there was a scramble for leases in that territory and just as mad a rush on the part of different companies for locations. The race was a pretty one—a fast and furious foursome. The Monarch Oil & Refining Company, the Humble Oil & Refining Company, the Gulf Production Company and the Crown Oil & Refining Company entered the sweepstakes without delay.

Monarch Completes Well

The Crown's hole was junked and one contender was eliminated. On September 29th the Monarch Company's No. 1 Smith et al, about 1200 feet due north of the Abrams No. 1 came in at 3287 feet with an estimated production of 1000 to 1500 barrels. It was drilled deeper and at 3318 feet the well came in for the second time, the production being estimated at 4000 barrels.

The Humble Oil & Refining Company's No. 1 Robertson, located about 1200 feet north and slightly west of the No. 1 Abrams came in a short time afterwards around 3240 feet. The initial flow was 1200 barrels but it soon sanded up. However, when the well came back the flow increased to between 12,000 and 14,000 barrels daily.

On the Masterson lease, some 1200 feet north of the Abrams well the Gulf Production Company brought in its No. 1 about October 1st, the production being at the rate of 10,000 barrels for five hours when it sanded

up. It came back October 12th for 4000 barrels.

Daily production at West Columbia on October 1st was about 31,735 barrels.

During the past year a number of good wells have been brought in around West Columbia. A summary of wells, initial production of which was more than 4000 barrels each, shows that during the 12 months, October 1, 1919, to September 30, 1920, 19 such "gushers" blew in.

Summary of "Gushers"

The summary is as follows:

October, 1919

Gulf Production Co.'s No. 9 Ayres, 3070 ft, 9000 bbls.

Texas Co.'s No. 3 Hogg, 3070 ft, 5300 bbls.

November, 1919

Sun Co.'s No. 3 Robertson, 3070 ft, 7000 bbls.

December, 1919

Humble Oil & Refining Co.'s No. 13 Japhet, 3100 ft, 6000 bbls.

Humble Oil & Refining Co.'s No. 11 Japhet, 3050 ft, 10,000 bbls.

January, 1920

The Texas Co.'s No. 30 Hogg, 3350 ft, 30,000 bbls.

Humble Oil & Refining Co.'s No. 12 Japhet, 3275 ft, 12,000 bbls.

Humble Oil & Refining Co.'s No. 15 Japhet, 3029 ft, 8000 bbls.

February, 1920

Sun Company's No. 4 Robertson, 3300 ft, 8000 bbls.

March, 1920

Texas Co.'s No. 37 Hogg, 2972 ft, 5000 bbls.

Humble Oil & Refining Co.'s No. 18 Japhet, 2952 ft, 10,000 bbls.

April, 1920

Gulf Production Co.'s No. A-1 Underwood Fee, 3200 ft, 4000 bbls.

Humble Oil & Refining Co.'s No. 4 Bashara, 3340 ft, 5000 bbls.

Texas Co.'s No. 33 Hogg, 3300 ft, 10,000 bbls.

May, 1920

Humble Oil & Refining Co.'s No. 23 Japhet, 3200 ft, 4500 bbls.

July, 1920

Texas Co.'s No. 1 Abrams, 2780 ft, 25,000 bbls.

Humble Oil & Refining Co.'s No. 26 Japhet, 3300 ft, 9000 bbls.

August, 1920

Humble Oil & Refining Co.'s No. 6 Coons, 3306 ft, 6000 bbls.

September, 1920

Humble Oil & Refining Co.'s No. 28 Japhet, 3400 ft, 14,000 bbls.

During the same 12 months there have been 94 completions at West Columbia. Of this number 67 were producers, the initial production of which totaled 199,360 barrels. The number of completions between October 1, 1918 to September 30, 1919, the year previous to that just considered, were 93 of which 51 were producers. The initial production of these wells was 116,905 barrels. The production for October 1, 1918, to September 30, 1919, was 5,957,037 barrels compared with a production for the succeeding year of 9,065,532 barrels.

Summary for 1918-19

A detailed comparison of the number of completions, producers, initial production and production by months for the two years as fol-

West Columbia Summary

Oct. 1, 1918, to Sept. 30, 1919	Completions	Producers	Failures	Initial Prod.	Monthly Prod.
October	4	2	2	1,150	7,000
November	1	..	1	.....	9,300
December	3	2	1	10,030	65,000
January	2	2	..	11,500	174,026
February	2	1	1	6,000	295,000
March	7	6	1	17,000	543,585
April	8	4	4	10,125	859,050
May	10	7	3	10,200	605,492
June	20	6	14	13,450	691,500
July	13	8	5	15,800	790,221
August	14	7	7	12,500	848,203
September	9	6	3	8,150	1,058,660
Totals (1919)	93	51	42	116,905	5,957,037
Totals (1920)	94	67	27	199,360	9,065,532

(Note.—Complete table for 1919-1920 may be found in this edition of The OIL WEEKLY, page 103.)

Thus it will be seen that West Columbia's gain in production for the past year was more than one-half while the percentage of producing wells jumped from 55 per cent in 1918-19 to 71 per cent in 1919-20.

That West Columbia had a better year than even the larger companies looked for is attested to by the fact that much of the storage in that section is in earthen tanks. And this when crude oil is worth $3 a barrel and purchasers begging for it at that price!

Early History of the Field

Labeled up until about 18 months ago as "one of the most disappointing prospective fields on the coast", West Columbia during the past year has disproved all frowns which had been given her. A complete comeback was staged, if not the few months prior to October 1, 1919, then the months which have followed. The most notable wells have been listed in this review.

For a time West Columbia field was known as Kiser's Mound. The first well was drilled in 1901 by the Equitable Mining Company and was located on the Arnold tract. At 500 feet it had a large quantity of gas and water which caused the operators to abandon. Other tests were started soon afterwards. The first successful test had a blow out at 480 feet and for more than a year produced five barrels of oil daily by natural flow.

From the time this well was completed until 1918 there were 40 or more wells drilled in the vicinity with little or no production. Shallow depths proved more attractive but several tests were drilled deeper.

Number 1 Equitable Mining Company drilled to 500 feet and stopped in rock. It had a good show of oil sand at 350 feet and

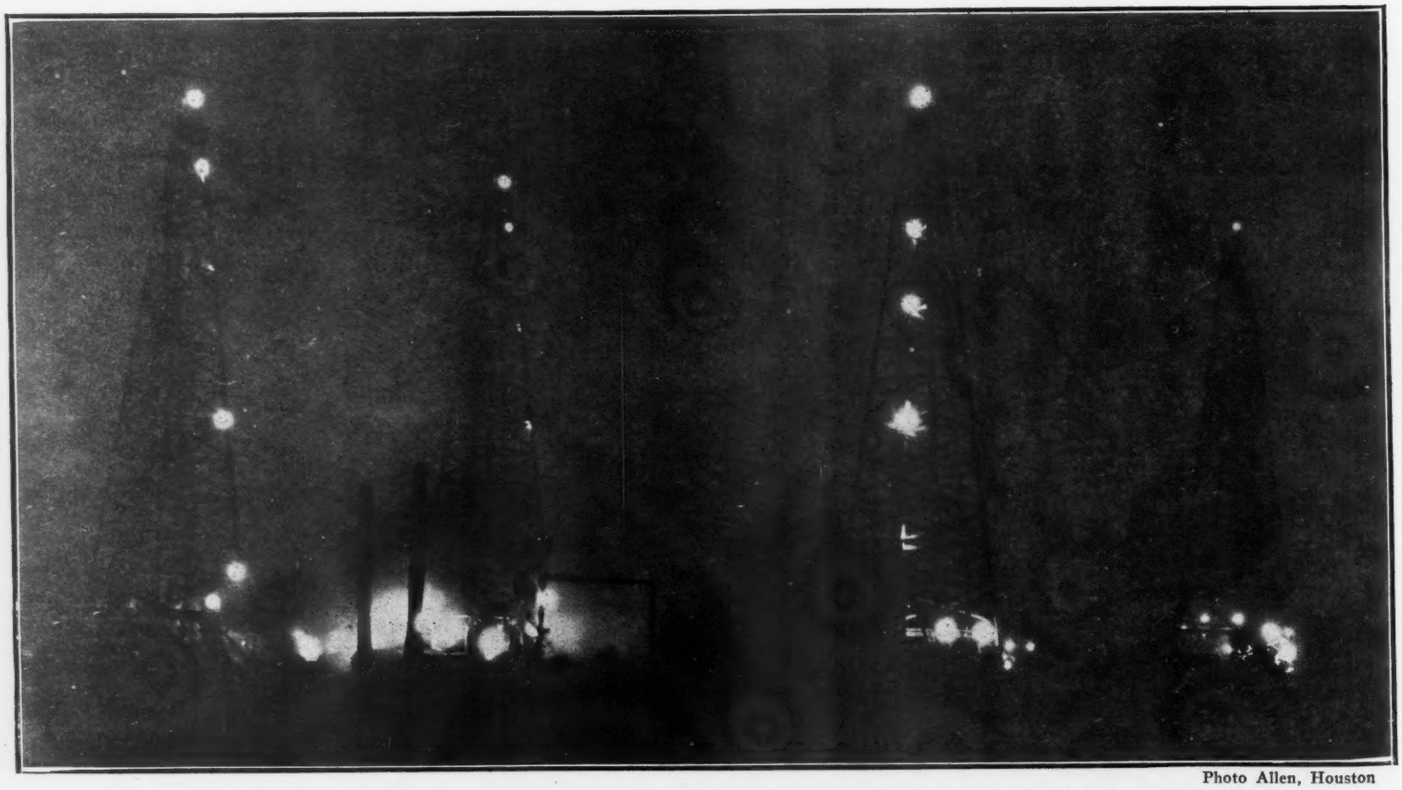


Photo Allen, Houston

NIGHT DRILLING SCENE AT WEST COLUMBIA. DERRICKS LEFT TO RIGHT ARE MONARCH, GULF AND HUMBLE (TWO).

Tulsa Machine & Tool Company

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Sole Manufacturers

Neilsons Multiple Sucker Rod Sockets. Made in 2, 2½ and 3 inch sizes
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Specify Neilsons Temper Screws With Your Next String of Tools

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Lone Star Gas Company

Producers of Natural Gas and Crude Petroleum

American Exchange National Bank Building, Dallas, Texas

On the way to the "new pool." Rushing casing through the town of West Columbia to the field

it was lost because of the presence of large volumes of gas and water. Number 2 Arnold, drilled by the same company blew out at 480 feet, showing heavy gas pressure and some oil. The gas caught fire, burned the derrick and necessitated building another. This is the well that flowed five barrels of oil a day for more than a year. It was abandoned because the market for the oil was not the best.

Sinclair and Crosbie drilled No. 3 Arnold to 1214 feet. Some showings of oil were found but it failed to make a producer.

The Arnold tract and the Hogg land immediately adjoining it on the east saw several wells go down at this time. Accurate information regarding these is lacking. But on lots 9 and 16 of the Hogg land the Markham Oil Company obtained good showings of shallow oil in several wells. One, on lot 16, came in making 50 barrels of heavy oil daily. Its depth was 380 feet. A great deal of water was later reported in the production. The hole finally was abandoned.

About 1910-11 drilling was started on the Hoff land west of the Arnold tract. Several fairly deep wells were drilled by the Palacios Oil Company and the West Columbia Oil Company. A number of shallow tests also were put down. One of the deep wells had a showing at 2250 feet while all of the shallow holes had showings.

The Producers Oil Company in the latter part of 1913 started a test on the southern edge of the dome and drilled ten wells in an effort to find deep sand.

In 1917 the Tyndall Wyoming Oil & Development Company completed a well which showed a few barrels a day at a depth reported around 2900 feet. Interest was revived in the field at this time. A second well brought in by this company was a fairly good producer, successfully answered the taunts of the disbelievers, and caused business to pick up. The larger companies began to make locations and in the fall of 1918 The Texas Company drilled a well on the Arnold land which came in at 2000 barrels.

This started development in earnest. A few fair to medium producers were credited the field before the Humble Oil & Refining Company startled the natives in the early part of 1919 with its No. 1 Giraud. This well was reported at 12,000 barrels daily.

From this time on the development has been more or less steady as may be seen by the monthly production figures given in connection with this review and in the general summary of Texas fields found elsewhere in this edition.

The following list shows the production of completed wells as of date October 1, 1920:

Company, Lease and Number	Depth	Initial Prod.	Present Prod.	Remarks
December, 1918				
Humble Oil Co., Giraud 1	3030	7,000		
Texas Co., Hogg 11	2615	30	8	Pumping
Humble Oil Co., Pipkin 1	2600	**		
January, 1919				
Dan Japhets, Hogg 3	3100	1,500		
Texas Co., Arnold 2	3050	10,000	160	Pumping
February, 1919				
Crown Oil & Ref. Co., Alchosky 1	3000	6,000	35	Pumping (well deepened)
Humble Oil & Ref. Co., Pipkin 1	3100	*		
March, 1919				
The Gulf Production Co., Ayres 1	2800	800	20	Pumping (well deepened)
The Crown Oil & Ref. Co., Marmion 1	3000	5,000		
Gulf Production Co., Hogg 1	2900	1,200	575	Flowing (well deepened)
Humble Oil & Ref. Co., Giraud 2	3050	6,000		

March, 1919—Continued

Company, Lease and Number	Depth	Initial Prod.	Present Prod.	Remarks
Humble Oil & Ref. Co., Marmion 1	3000	2,000	250	On air
Gulf Production Co., Ellers 1	3100	3,000		
Gulf Production Co., Williamson 1	2900	*		
April, 1919				
Humble Oil & Ref. Co., Prensky 1	3400	*		
Humble Oil & Ref. Co., Marmion 2	3000	5,000		
Texas Co., Hogg 17	2975	1,000	75	Pumping
Humble Oil & Ref. Co., Coons 1	3200	125		
Humble Oil & Ref. Co., Boyles 1	3400	*		
Gulf Production Co., Ayers 2	2900	4,000	10	Pumping (well deepened)
Sun Co., McGregor 1	3500	*		
Texas Co., Hogg 22	2875	*		
May, 1919				
Gulf Production Co., Weems 1	3420	700		
Crown Oil & Ref. Co., Marmion 2	3160	3,000		
Sun Co., Robertson 1	2975	300		Off
Humble Oil & Ref. Co., Diggs 3	3900	**		
Texas Co., Hogg 15	3014	2,500	217	Pumping (well deepened)
Gulf Producton Co., Ayers 3	2862	1,500	25	Pumping (well deepened)
Crown Oil & Ref. Co., Alchosky 2	3186	1,800	45	Pumping (well deepened)
Gulf Production Co., Hogg 2	3200	400	200	Flowing by heads
Phoenix Oil Co., Melgard 1	1785	**		
June, 1919				
Texas Co., Hogg 16	3030	4,000	110	Pumping
Gulf Prod. Co., Sweeney 1	3200	*		
Sun Co., McGregor 1	3800	*		
Gulf Coast Corp., Smith 1	3550	*		
Humble Oil & Ref. Co., Japhet 7	2909	*		
Humble Oil & Ref. Co., Piplin-Carroll 7	2989	†		
Gulf Production Co., Hogg 3	3100	*		
Humble Oil & Ref. Co., Waters 1	3300	750		
Humble Oil & Ref. Co., Japhet 6	2810	**		
Humble Oil & Ref. Co., Japhet 5	2900	5,000	300	On air
Humble Oil & Ref. Co., Prensky 1	3010	**		
Humble Oil & Ref. Co., Armstrong 1	3440	*		
Humble Oil & Ref. Co., Bashara 2	1930	†		
Humble Oil & Ref. Co., Coons 2	1100	†		
Texas Co., Arnold 3	2974	**		
Texas Co., L. J. Wilson 1	2520	**		
Texas Co., Josephine Wilson 1	1526	**		
Gulf Production Company, Ayers 5	2900	1,500	30	Pumping (deepened well)
Gulf Production Co., Ayers 4		400		
Texas Co., Hogg 21		1,800		
July, 1919				
Texas Co., Hogg 24	3030	4,000		
Crown Oil Co., Marmion 3	3080	3,000		
Crown Oil Co., Sealy	3600	*		
Tyndall-Wyoming, Hogg 1	2000	**		
Humble Oil Co., Japhet 7	3100	3,000	350	On air
Gulf Production Co., Prell 1		500		
Gulf Production Co., Sweeney 1		**		
Harris et al, Moody 1		**		
Gulf Production Co. McMeans 1	3300	200	200	Pumping (well deepened)
Texas Co., Hogg 25	3133	100	35	Pumping
August, 1919				
Gulf Production Co., Metzger 1	3100	**		
Texas Co., Arnold 22	2875	**		
Texas Co., Hogg 18	3000	1,500		
Texas Co., Hogg 24	3140	150		
Yoakum-Columbia Oil Co., Kiser 1	2200	**		
Humble Oil & Ref. Co., Japhet 8	3100	8,000	350	On air
Texas Co., Arnold 9	3044	1,000	155	Pumping
Crown Oil Co., Marmion 2	3050	2,000		
Texas Co., Brown 1	2000	**		
Humble Oil & Ref. Co., Moore 1	3455	**		
Sinclair Gulf Co., Falkney 1	3650	**		
September, 1919				
Texas Co., Arnold 14	3040	1,000		
Sta-Tex Oil Co., Kruce 1	2700	**		
Humble Oil & Ref. Co., Japhet 9	3035	1,000	50	Pumping
Humble Oil & Ref. Co., Japhet 10	1125	**		
October, 1919				
Texas Co., Hogg 27	3920	1,000		
Prudential Sec., Bartlett 1	3335	**		
Humble Oil & Ref. Co., Coons 3	3395	2,000	20	Pumping
Texas Co., Hogg 29	1320	†		
Gulf Production Co., Hogg 3	3320	150	90	Pumping
Gulf Production Co., Ayers 6	3070	9,000		
Texas Co., Hogg 3	3070	5,300		
November, 1919				
Sun Co., Robertson 2	3160	1,000	30	Pumping
Humble Oil & Ref. Co., Bashara 3	3400	1,000	75	Pumping
Humble Oil & Ref. Co., Marmion 3	3198	1,200	50	Pumping
Texas Co., Hogg 18	3050	650		
Sun Co., Robertson 3	3070	7,000	75	Pumping

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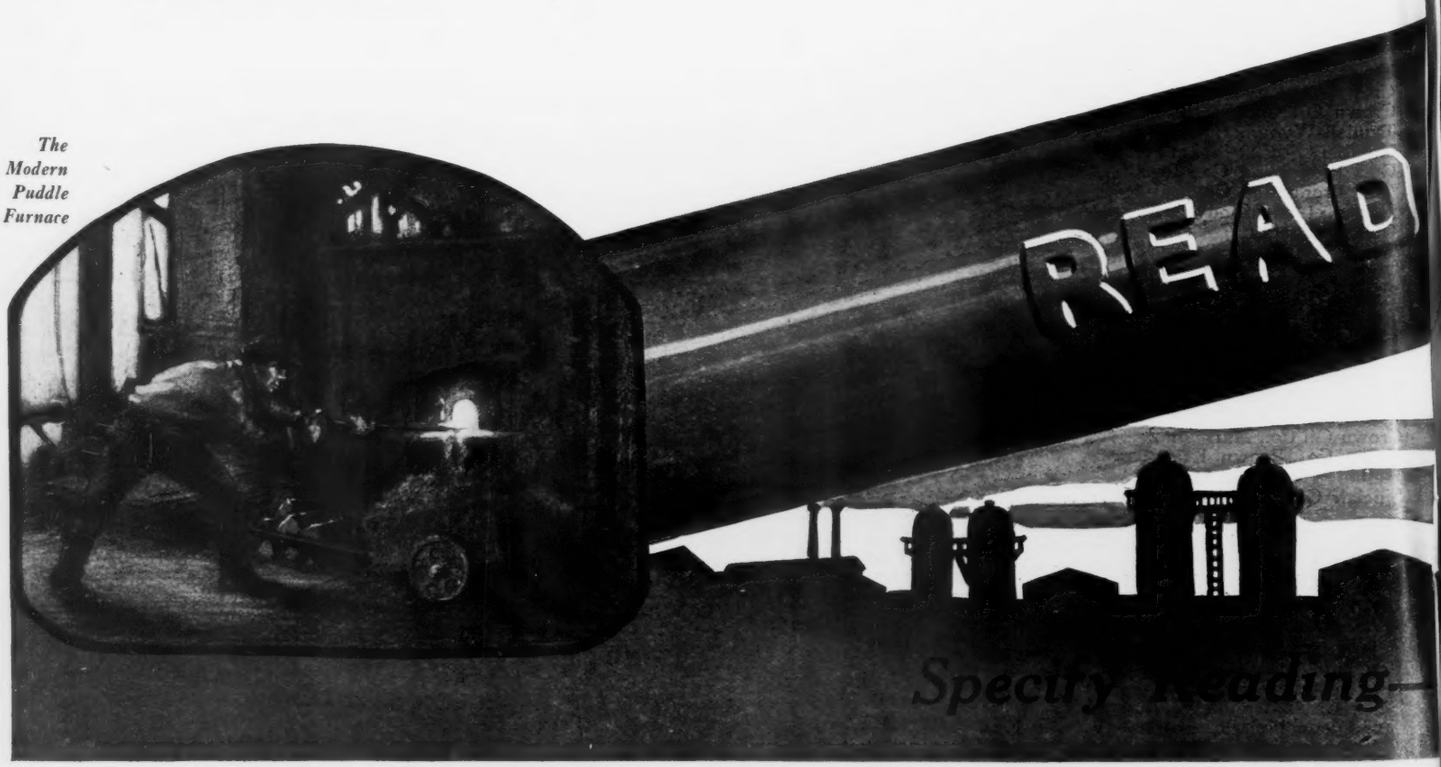

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Company, Lease and Number	Depth	Initial Prod.	Present Prod.	Remarks
December, 1919				
Corporation Hermann, 27	1250	*		
Texas Co., Herman 179	1235	*		
Texas Co., Landslide 240	2300	*		
Texas Co., Burt 15	2100	20		
Crown Oil & Ref. Co. and Gulf Coast Oil Corp., Webb 1		*		
January, 1920				
Texas Co., Hogg 27	3012	3,000	355	Flowing
Texas Co., Hogg 30	3350	30,000		
Humble Oil & Ref. Co., Japhet 12	3275	12,000	300	On air
Humble Oil & Ref. Co., Japhet 15	3029	8,000	300	On air
February, 1920				
Humble Oil & Ref. Co., Giraud 1	2400	*		
Great Belt Oil Co., Hogg 2	3275	*		
Humble Oil & Ref. Co., Japhet 16	1800	*		
Lucky Jim Oil Co., Brown 1	3325	*		
Texas Co., Hogg 28	3000	500		Off
Humble Oil & Ref. Co., Japhet 14	3300	*		
Sun Co., Robertson 4	3300	8,000	25	Pumping
Gulf Production Co., E. J. Eyres 6	3528	*		
March, 1920				
Humble Oil & Ref. Co., Japhet 18		10,000	300	On air
Texas Co., Hogg 37	2972	5,000		
April, 1920				
Humble Oil & Ref. Co., Bashara 4	3340	5,000	100	Pumping
Texas Co., Hogg 13	3250	1,000	150	Pumping
Gulf Production Co., E. J. Eyres 7	3100	500		
Gulf Production Co., Underwood Fee A 1	3200	4,000		
Humble Oil & Ref. Co., Japhet 17	3057	200	50	Pumping
Humble Oil & Ref. Co., Bashara 5	3200	35		
Humble Oil & Ref. Co., Coon 5	3100	25		
Texas Co., Hogg 33	3300	10,000		Off
Humble Oil & Ref. Co., Japhet 19	3300	3,000	400	Pumping
†Sun Co., Robertson 4	3310	50		
May, 1920				
Texas Co., Arnold 18	3050	850	30	Pumping
Humble Oil & Ref. Co., Japhet 21	3300	1,000	100	Pumping
Humble Oil & Ref. Co., Japhet 23	3200	4,500	100	Pumping
Humble Oil & Ref. Co., Bashara 5	3450	*		
Humble Oil & Ref. Co., Pipkins 3	3400	*		
Gulf Production Co., Eyres 4	3050	*		
Gulf Production Co., Eyres 7		150	35	Pumping
June, 1920				
Humble Oil & Ref. Co., Japhet 22	3319	250	100	Pumping
Texas Co., Arnold 13	3020	175		Off
Texas Co., Hogg 19	2850	100		Off (plugged back)
Gulf Production Co., McMeans 2	3400	300	100	Pumping
Sun Co., McGregor 1	3167	65		
July, 1920				
Gulf Production Co., Hogg 7	3100	600	100	On air
Gulf Production Co., Masterson 1	2765	15		
Gulf Production Co., McMeans 3	3325	2,500	110	Pumping
†S. A. McMeans, Fee 3	3325	2,000		
Texas Co., Hogg 39	3395	130		
Texas Co., Hogg 35	3395	150	115	Pumping
Texas Co., Hogg 37	3000	500	791	On air
Texas Co., Hogg 38	3284	300		Off
Texas Co., Abrams 1	2780	25,000	7,500	Flowing
Humble Oil & Ref. Co., Japhet 24	2350	200	75	Pumping
Humble Oil & Ref. Co., Japhet 25	3260	300	100	Pumping
Humble Oil & Ref. Co., Japhet 26	3300	9,000		Off
Peoples Oil & Gas Co., Bartlett 1	2860	*		
August, 1920				
Southern Pet. & Ref. Co., Hogg 2	3400	200		
Gulf Production Co., Eyres 8	3200	200	20	Pumping
Texas Co., Hogg 32	3365	†		
Texas Co., Hogg 40	3288	1,200	600	Pumping
Texas Co., Arnold 20	3100	1,000	550	On air
Crown Oil Co., Marmion 4	2450	10		
Humble Oil Co., Coons 6	3306	6,000	300	Flowing
Sun Company, McGregor 1	3300	*		
September, 1920				
Gulf Production Co., Tom Hogg A6	3150	*		
Gulf Production Co., Tom Hogg A4	3392	*		
Humble Oil & Ref. Co., Bashara 6	2585	35	35	Pumping
Crown Oil Co., Marmion 1	3100	*		
Texas Co., Hogg 44	3350	50	115	Pumping
Texas Co., Arnold 14	3225	*		

The following wells not contained in the above list were reported on October 1, 1920, as follows:

Company, Lease and Number	Production	Remarks
Humble Oil & Ref. Co., Japhet 3	15	Pumping
Humble Oil & Ref. Co., Japhet 11	100	On air
Humble Oil & Ref. Co., Japhet 13	300	On air
Humble Oil & Ref. Co., Japhet 20	10	Pumping
Humble Oil & Ref. Co., Japhet 28	12,000	Flowing

*Salt water. **Abandoned. †Junked.

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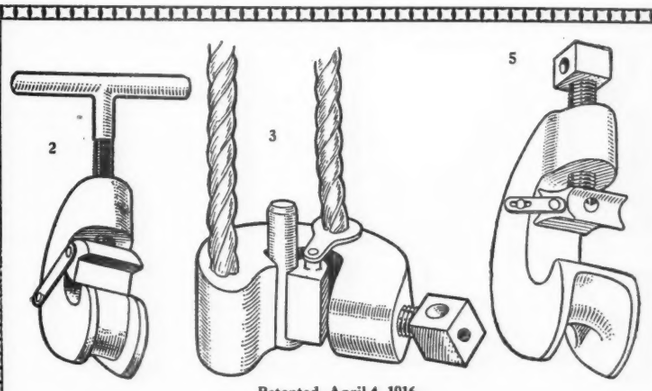

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Action of Centrifugal Separator Described; One Dehydration Mode

(Editor's Note.—The accompanying article describing the process by which a centrifugal machine separates b. s. and water from oil was written by an engineer of the De Laval Separator Company. It should be read in connection with the article on dehydration which appears on page 146 of this issue.)

IT has long been known that centrifugal force acts the same as gravity, many times multiplied, in separating liquids of different specific gravities or in removing solids from liquids. For centuries the mechanical problems of harnessing centrifugal force to do this work have engaged the thought and experiment of eminent scientists and inventors. Only within the last forty years, however, has the principle been practically and efficiently applied to commercial and industrial purposes.

It is generally acknowledged that the credit for designing the first practical centrifugal machine for separating and purifying various liquids belongs to Dr. Gustaf De Laval, who in 1878 invented the first practical machine, continuous in operation, for separating two liquids of different specific gravities. Since that time the use of centrifugal force has been extended to take in the separation, clarification, purification and filtration of products of many industries.

Of particular interest to the oil man is the process that has been worked out by the De Laval Separator Company for purifying crude oils, refinery oils, skimming plant oils and fuel oils.

The De Laval Oil Purifier consists essentially of a cast-iron frame supporting a bowl containing a number of discs. The oil to be purified is fed into the top of the bowl and passes down the center to the bottom, whence it flows out and up through the holes or neutral zones in the discs and is distributed in thin layers between the discs.

Here due to centrifugal action separation takes place. The impurities and free water in the oil are thrown outward to the periphery of the bowl and are continuously discharged from the bowl through the sludge cover of the machine.

Oil Passes Inward

The oil, being lighter, passes inward between the discs, where the thin layers are subjected to tremendous centrifugal force, which throws out the remaining traces of impurities and water. These impurities are forced along the lower surface of each disc toward the periphery and discharge outlet of the bowl, and the pure oil is thus displaced and forced toward the center, and from there upward to the oil discharge outlet.

Surmounting the bowl are two covers which receive the discharges of the bowl. In addition to the discharge covers, another, known as the overflow cover, is provided. If at any time the bowl becomes clogged by a large amount of dirt so that the liquid can no longer flow through, the inlet tube fills up and overflows into this cover. This keeps the overflow separate and acts as a warning signal that the bowl needs cleaning. At the top is the regulating cover into which the liquid flows before it passes into the bowl.

Earlier types of centrifugal separators use what is known as a hollow bowl; that is, a one-piece tubular-shaped bowl with openings at the top, through which the purified oil and the water containing the impurities are discharged.

There is a constant conflict between the current of b. s. and water and that of the pure oil. This re-mixing of the partially purified oil is avoided by the disc construction of the more-modern bowl. In this type of bowl the outward pressure of the heavier parts of the mixture (b. s. and water) is always against the bottom side of each disc. The pure oil being lighter moves along the upper side of each plate toward the center.

Significant Step Taken

The invention of the disc bowl marked one of the longest steps forward in the design of centrifugal separators and purifiers. It not only improved the separating efficiency of the machine, but doubled the capacity of any size bowl without increasing the speed at which it was required to revolve. Thus the mechanism of the machine is subjected to less wear and its life is prolonged.

The action of the bowl is so perfect that if clear oil enters the bowl there will be no discharge through the sludge outlet, while if water only passed through the bowl, nothing will come out of the oil outlet.

By the use of centrifugal purifiers the slow and costly process formerly used to purify petroleum oils is reduced to simply running the oil from the storage tank, through the purifiers, from which pipe line oil is continually delivered. The bottom setlings and water are sludged out through the waste spout of the machine in such a way that shutting down for cleaning is seldom necessary, this depending largely on the condition and amount of b. s. In many installations, the machines are running all day without cleaning and at the end of the day's run the purifier bowl contains less than a pint of b. s., so perfect is their sludging ability.

In a few cases of particularly bad emulsions, it has been found necessary to add a simple and inexpensive chemical treatment to the above described method.

WEST COLUMBIA—Concluded

Company, Lease and Number	Production	Remarks
Humble Oil & Ref. Co., Coon 4	80	Pumping
Humble Oil & Ref. Co., Bashara 7	75	Pumping
Humble Oil & Ref. Co., Bashara 8	15	Pumping
Humble Oil & Ref. Co., Geraud 4	200	On air
Humble Oil & Ref. Co., Geraud 5	200	On air
Humble Oil & Ref. Co., Geraud 6	26	Pumping
Humble Oil & Ref. Co., Carroll 2	10	Pumping
Sun Co., Robertson 5	25	Pumping
Southern Petroleum Co., Roberts 2	275	Pumping
Texas Co., Arnold 5		Off
Texas Co., Arnold 19	300	Pumping
Texas Co., Hogg 10	10	Pumping
Texas Co., Hogg 12	135	On air
Texas Co., Hogg 31	35	Pumping
Texas Co., Hogg 34	100	Pumping

*Salt water. **Abandoned. †Junked.

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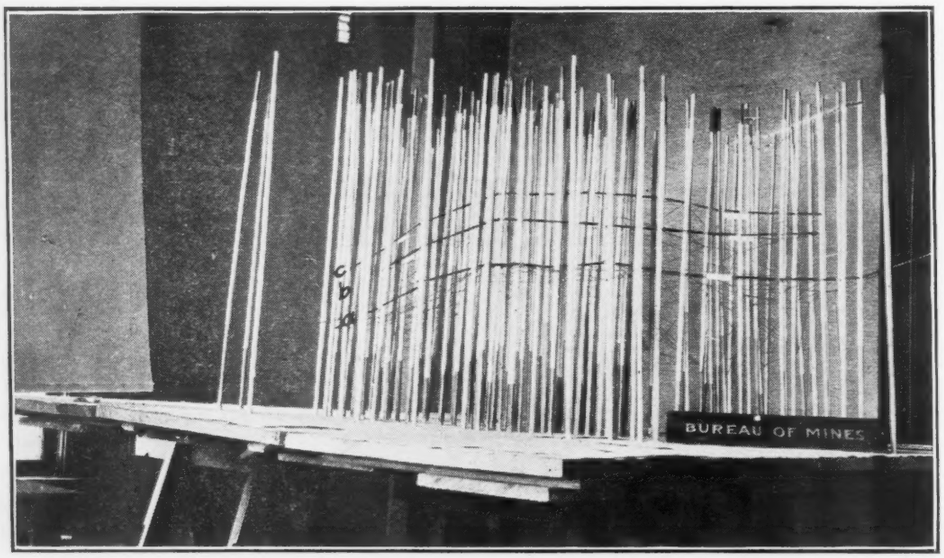
Peg Model of Hewitt Field of Much Value to Operators

ARDMORE, OKLA., Oct. 15.—The photograph is a pictorial representation of the peg model of the Hewitt field, which was constructed as a part of the work being carried on by T. E. Swigart and F. X. Schwarzenbek, government petroleum engineers with the United States Bureau of Mines. The bureau, through these men, is assisting the operators of that territory in solving their drilling and production problems by actual individual investigations and by construction and maintenance of the peg model, and numerous engineering cross-sections of the field.

There are three networks of strings on the model. One of them, the lower (marked "A") represents the top surface of the Hewitt oil sand. This network shows how the sand is folded and how it dips from the center of the field to the edges of the field. The string and pegs readily prove to the eye that the sand found in the center of section 22 at a depth of about 1350 feet, is the same sand that produces in sections 21 and 27 at much greater depths (2200 feet, approximately). The relationship between certain other oil and gas sands which are not the Hewitt sand can also be seen by examination of the model.



PEG MODEL OF HEWITT FIELD (OKLA.) MADE FOR BENEFIT OF OPERATORS

The middle network of red strings (marked "B") shows the surface of an upper oil sand and brings out the relationship of the various sands nicely.

Dip Practically the Same

The upper network of strings (marked "C") further emphasizes the principles of stratigraphy and structure. It represents the surface of a certain water sand which lies parallel to the Hewitt sand and about 700 feet above it. It will be noticed that the dip in the three sands is practically the same.

Pink pins near the top of the pegs show the base of the red beds as recorded by drillers in various wells.

Yellow pins give the casing points of those strings of casing which shut out the upper water (known as the water string).

The model is used to determine the proper depth to remove rotary tools in new drilling wells, the proper casing points, depths to the oil sand, in any well the possibilities of deeper sands in any particular locality, etc. By a study of the model, certain cases of improper development come to light. Examples of these are cases of rotary tools being carried too deep, shutting off the top layer of the Hewitt sand, casing landed too high, unsystematic casing, dry holes which did not reach the producing sand, etc.

The model is also of great service to companies owning property on the edge of the field. By studying the structure and governing the drilling campaign accordingly, a minimum number of dry holes will determine the limits of the field.

Peg Model Is of Benefit

The model, which has been on display at the offices of the bureau in the Ardmore (Okla.) Chamber of Commerce rooms for over a month, has already been of great benefit to numerous operators in the Hewitt field. Each day further development substantiates and adds to the principles displayed on the model. For instance, the model shows that the dry holes in section 27 did not go deep enough to reach the pay sand and that much of that territory may yet be good. This has recently been further proved by the new Texas Company Denny well No. 4, which came in for about 500 barrels a distance of 660 feet south of the southmost line of producing wells.

Another extension of vital importance is indicated on this peg model. In the Humble-Voorhees No. 1, section 9, the sand is seen to rise again to a level even higher than that reached in section 22.

In the photograph above, the last peg on the right-hand side is the Humble-Voorhees well. It can readily be seen that the sand is rising again and that a new and possibly larger structure may be found.

The field office of the United States Bureau of Mines for the Hewitt field is at Ardmore. It is under the direction of T. E. Swigart, petroleum engineer with the bureau. Mr. Swigart has had both practical and technical training in California, in addition to his work for the Bureau of Mines in Oklahoma oil fields. Before commencing on the Hewitt investigation, Mr. Swigart had investigated and issued government reports on the Comanche oil field, and the Walters oil and gas field.

F. X. Schwarzenbek, who is associated with Mr. Swigart in the Hewitt investigation, left a position in California with the Southern Pacific Railroad Company Fuel Oil Department, to accept a position as petroleum engineer with the Bureau of Mines.

Both men are graduates in engineering courses of Leland Stanford, Jr. University.

On account of a shortage of state funds a decision recently was made to return Mr. Swigart and Mr. Schwarzenbek to Bartlesville, where they were to finish their work in the Hewitt field in the form of a report. When this decision was announced, Hewitt field operators through the Ardmore Chamber of Commerce voluntarily contributed $1000 for continuation of the work of the Bureau of Mines in that field. Additional money will be ready in case it is deemed advisable to continue the work more than sixty days.

The oil committee of the Ardmore Chamber of Commerce has sent letters to each company explaining that the bureau representatives will confer with them on the drilling of their wells to provide (1) proper protection of the upper gas sands, (2) a minimum amount of water trouble, and (3) the proper depth to land the water strings.

There is nothing compulsory and each operator can use the service of the bureau representatives if he so desires. One operator put it this way: "I can see where the advice of these men may be worth $100,000 to my company."

Investigation of Mexican Holdings Are Being Made

Ponca City, Okla., Oct. 15.—Extensive geological investigations of lands belonging to the Marland Oil Company of Mexico, S. A., are being made by a force under the general direction of Carl H. Beal, petroleum engineer, of San Francisco. These lands are on the West Coast and are within the state of Sonora and the territory of Lower California.

Under the general direction of Clarence E. Hyde, a geological investigation also is being made of the company's lands on the East Coast, largely in the Panuco region with considerable holdings in the Isthmus of Tehauntepec. It was announced that actual development of the lands on the East Coast will be started at an early date while development on the West Coast will await the result of the present geological investigations that are being made.

The Marland Oil Company of Mexico, S. A., a Mexican corporation is a holding company of two separate Mexican corporations, each of which controls lands in its own relative locality—namely, The Consolidated Oil Companies of Mexico, S. A., which controls the lands on the East Coast and the Compania

CHANGE OF ADDRESS

The OIL WEEKLY has been notified of a change in address of the research laboratories and factory of the Sharples Specialty Company, manufacturers of centrifuge machines. The address contained in the advertisement in this edition is given as West Chester, Pa., when it should be Twenty-third and Westmoreland streets, Philadelphia, Pa.

CAN SHORTAGE HAMPERS PAINT MAKERS

David Lewis, of Marden, Orth & Hastings, is just back from a business trip to St. Louis. Mr. Lewis reports St. Louis manufacturers of oil products as suffering badly from lack of cans. One paint manufacturer stated that he could make and sell four times his present production if he could get the cans.

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Oil Exports From Mexico on the Increase

Shipments Out of Tampico Make it Largest Oil Port

EXPORTS of oil from Tampico have for several months reached a total considerably in excess of the shipments of oil from the United States. Shipments from all ports of the United States averaged about 5,000,000 barrels a month during 1919, compared with the present hsipments from Tampico of between twelve and fifteen million barrels. Monthly oil exports since January, 1920, are as follows:

Month	Barrels
January	8,061,289
February	7,687,943
March	10 288,383
April	10,092,312
May	11,255,531
June	10,574,396
July	12,275,021
August	15,438,008
Total for eight months	85,672,883

These figures include all Mexican exports but more than 80 per cent of Mexican oil comes out of Tampico. The growth of the port as a center of oil shipment is obvious from a glance at the table.

Next to Tampico the principal oil ports are New York and Port Arthur, Texas. Texas City and Galveston, two other Texas ports also are making strides in the matter of oil shipment.

New York takes a prominent place due to the several large refineries around the harbor. These refineries have a total capacity of 125,000 or more barrels daily. Possibly a third of the oil used by these refineries comes originally from Tampico.

Port Arthur furnishes the location for a number of large refineries, notably the Gulf Refining Company's 65,000 barrel plant and The Texas Company's 32,000 barrel plant. Much oil used by these refineries comes from the Gulf Coastal fields or the sections in North and Central Texas and Oklahoma.

A large amount of oil is dispatched through Galveston and Texas City. The Gulf Production Company, the Mexican Petroleum Corporation and others have terminals at Galveston and the traffic of oil steamers between the Island City and Tampico is of much importance. The same may be said of Texas City where several companies, including the Humble Oil & Refining Company, have terminals for loading and unloading of tankers.

As shown by the figures for 1920, Tampico is almost certain to enjoy a steady growth in the matter of oil exports. Mexico as a producer of petroleum is becoming more important daily and Tampico is expanding accordingly. Oil shipping facilities are being extended daily. Large companies are increasing not only their holdings in the various fields and wildcat sections, but taking up every acre of land in and around Tampico and the Panuco River. It is no uncommon sight to see a half hundred or more tankers, representing investment of possibly a hundred million dollars, anchored in the Panuco River at one time.

The first eight months of 1920 showed exports totaling more than 85,000,000 barrels or more than 15,000,000 more than was exported during the whole of 1919. Mexico is shipping between one-fourth and one-third as much as the United States is producing.

In August when all records for Mexican oil exports were broken two companies shipped more than 2,000,000 barrels each and five other companies exported oil in excess of 1,000,000 barrels each. These companies were the Transcontinental and Huasteca, more than 2,000,000 barrels each and Aguila, Island Oil, Texas, Cias. del Agwi, and Mexican Gulf more than 1,000,000 each.

In The Mexican Review, the organ of the Mexican government, figures were recently given as to the value of the oil industry in that country. The estimate was as follows:

Wells	$ 37,000,000
Pipelines	60,000,000
Storage tanks	60,000,000
Vessels	90,000,000
Refineries	50,000,000
Accessories	33,000,000
Total	$330,000,000

To this sum, the Review continues, should be added the value of the lands possessed by the oil companies and which are in the neighborhood of 300,000 hectares (750,000 acres) and worth at the rate of $100 (Mexican) per hectare, a total of $300,000,000, making a grand total of $650,000,000 ($325,000,000 American money) invested in the petroleum industry. No account is taken in this estimate of the area of land under lease.

The reason for heavy shipments out of Mexico may be seen by a glance at the following, which shows the actual output of oil since Mexico began to produce in 1901:

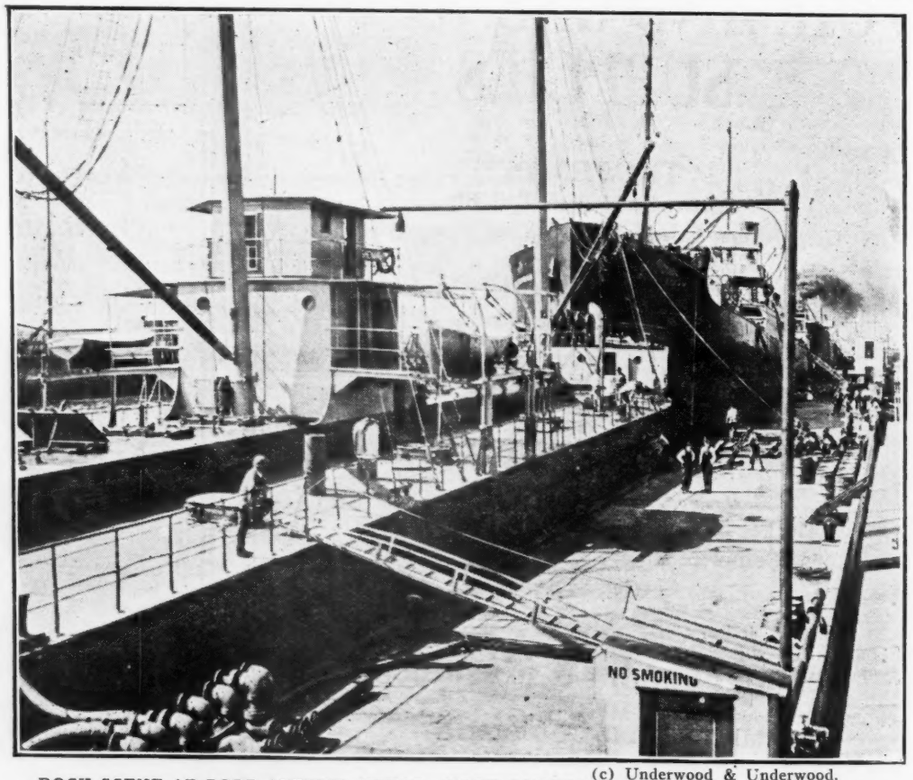
	Barrels
Present annual rate	150,000,000
1919	90,000,000
1918	63,000,000
1917	55,293,000
1916	40,545,700
1915	32,910,500
1914	26,235,400
1913	25,696,300
1912	16,558,200
1911	12,552,800
1910	3,634,100
1909	2,713,500
1908	3,932,900
1907	1,005,000
1906	502,500
1905	251,250
1904	125,625
1903	75,375
1902	40,200
1901	10,345

Mexico has practically doubled its production and shipments in the last year and this oil, brought to the United States exclusively in tankers, no overland shipments yet being recorded, has enabled American refiners to meet the heavy demand for gasoline, fuel oil and lubricants.

The first oil produced in South America is credited to the republic of Peru; this in 1896, when the production was 7,536 barrels.

Mexico's oil production has not fallen below the ten million barrel mark for any single year since 1911. First oil was produced in Mexico ten years previous to this date (1901), when production amounted to 10,345 barrels.

In 1861 the United States produced 99.1 per cent of the world's oil. Of the total of 2,130,917 barrels, the United States produced 2,113,609 barrels.



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DOCK SCENE AT PORT ARTHUR, TEXAS. NOTE CONNECTIONS AT LOWER LEFT OF PICTURE BY WHICH OIL IS LOADED AND UNLOADED

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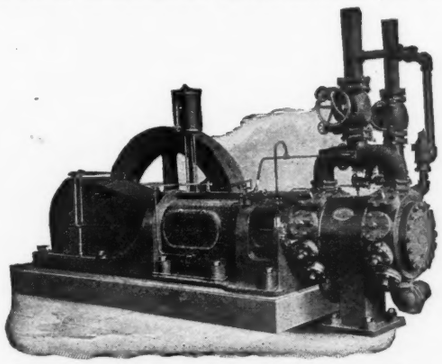

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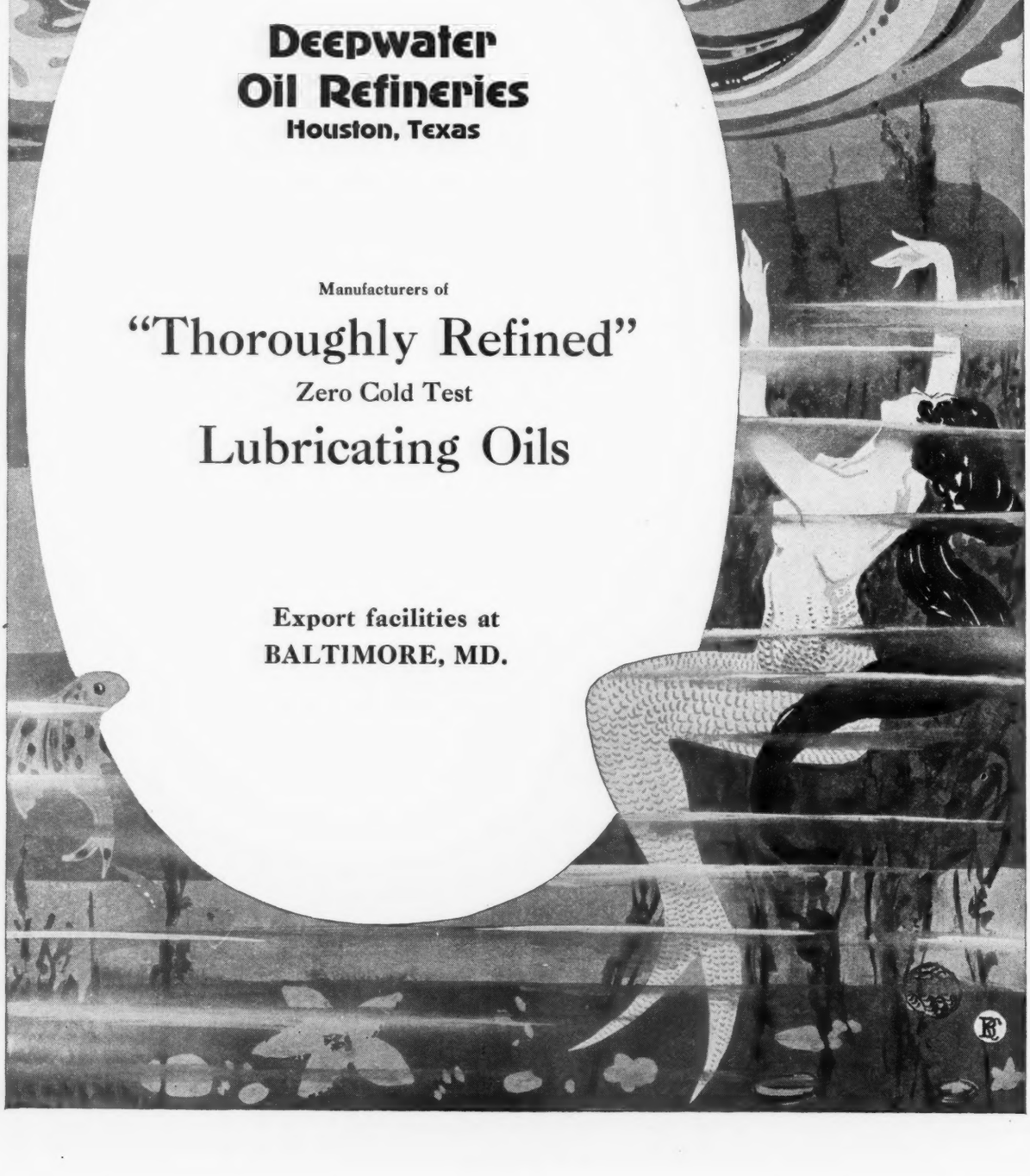
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PERSONAL MENTION-MEN YOU KNOW

Henry Arnold, in the producing department of the Humble Oil & Refining Company at Houston, has a new title. Also, Henry has left Houston for a trip to the bright lights in New York. Neither incident, however, has a bearing on the other. Some time back, when the Confederate Veterans held their reunion at Houston Arnold was designated as aide to the admiral in command of the Confederate Navy. He was given a string of instructions as long as his arm and down at the bottom was a sentence promoting him to captaincy in the Confederate Navy. So now it's Captain Arnold on the tenth floor of the Humble's building in Houston.

L. M. Fanning, statistician of the American Petroleum Institute, New York, who has been making a tour of the oil fields of the Southwest, was in the Gulf Coast section during the past week.

E. E. Grant, secretary of the Independent Oil Men's association, returned during the past week to Chicago from Denver, where he remained after the convention attending to post-convention affairs.

J. D. Berry, president of the James B. Berry's Sons Company and Sam Messer, vice president, are on a trip through which their company is interested.

W. H. Bennett, formerly in the engineering department of the Sun Company at Dallas, has gone to Venezuela, where his company has properties.

T. J. Gay was honored by reelection as president of the Independent Oil Mens' Association at the Denver convention. A. G. Squier of New York was selected as sergeant-at-arms.

Charles S. Jones has resigned as chief for the Sinclair Oil & Gas Company in Oklahoma, and will hereafter be identified with the Riverland Oil Company as field manager.

Bert Brodie, in charge of the North Texas operation of the Humble Oil & Refining Company, was in Houston for the week end to attend the meeting of department heads. He was accompanied from Wichita Falls by G. E. Bates, D. B. Harris and O. A. Stovall.

J. A. Anderson, Jr., president of the Humble Pipe Line Company, has returned to his office in Houston from a vacation spent all over the United States.

John J. Dempsey has resigned his position as general manager of the Seamans Oil Company in Oklahoma to engage in other business. Before entering the oil business, Mr. Dempsey was manager of the Brooklyn Rapid Transit.

H. A. Buehler, state geologist of Missouri, has been visiting in Colorado recently looking into the shale industry.

UNDERWOOD NAZRO,

Vice president of the Gulf Production Company, Gulf Pipe Line Company, Gulf Refining Company of Louisiana, and the Mexican Gulf Oil Company. Mr. Nazro was born in Kentucky, got his first oil experience in West Virgina, and broke into the oil game in Texas at Spindle Top. He was a successful independent operator before coming with the Gulf companies, and was the organizer of the Unity Oil Company with production at Spindle Top. He has been with the Gulf for nine years, and is recognized as one of the best operators in the Southwest. Mr. Nazro is married and has two children. His home is in Houston.

John D. King of Connecticut, prominent republican who is interested in oil properties in Oklahoma, has been elected vice president of the Wichita Falls, Ranger & Fort Worth railway.

A. M. Ambrose, superintendent of the experimental station at Bartlesville, conducted by the Bureau of Mines, visited several points along the route on his return home from the convention at Denver.

Grant Jacobs of Ft. Worth, Texas, has been recognized as president of the International Oil, Gas and Refinery Workers by President Samuel Gompers of the American Federation of Labor. Several locals have refused to recognize the election of Mr. Jacobs to the presidency.

E. M. Dillion has returned to his home at Oklahoma City after a visit in Cuba. He found much interest in oil there, but said no successful well had been drilled. One refinery is operating in Cuba and the Sinclair organization is preparing to ship crude to Cuba from Mexico.

Miss Marian E. Quinby had the pleasure of christening a large tanker which was launched recently on the Delaware and named Joseph Seep, in honor of her grand father. The vessel is the property of the Standard Oil Company and the name was selected to honor the celebrated buyer of crude.

A. B. Patterson, production department of The Texas Company, returned to Houston headquarters during the week from a visit in North Texas.

President-Elect Obregon of Mexico spent a few very busy days this week in Texas. He was honored at Dallas and Fort Worth, was "recognized" by Governor Hobby and otherwise treated as an honored guest. He made several stops in the state enroute to Dallas for the fair. He promised that business men and oil interests will have a square deal under his administration.

W. L. Connelly of the Sinclair organizations, who recently returned from Mexico, left Houston Saturday for New York.

David E. Plattner has resigned his position with the Skelly Oil Company in the Hewitt field, and will act as drilling superintendent for the Tropical Oil Company in Ecuador.

Edgar Stilley, formerly Southern representative of the Link-Belt Company, with headquarters at Philadelphia, has been made Mid-Continent manager of the Clark Brothers Engine Company at Tulsa, and will supervise the business for this company in all the oil fields from Wyoming to the Coast.

D. H. Freel, superintendent of the Northern division of the Humble Pipe Line Company, was in Houston during the past week.

Central and South America and the West Indies

By Silas B. Ragsdale

INCLUDING the production of the Island of Trinidad, South America is today producing about one and one-half per cent of the world's output of crude oil. More is expected of these countries. And prospectors tell us that more will be forthcoming. Peru, Trinidad, Argentina and Venezuela are now listed among the real oil producers as follows:

Peru, 2,500,000 barrels per annum.
Trinidad, 2,100,000 barrels per annum.
Argentina, 1,300,000 barrels per annum.
Venezuela, 200,000 barrels per annum.

Scattered production in other sections of South America puts the total production past the 7,000,000 barrel mark.

Colombia, Bolivia, Brazil and other countries are to be heard from, and although it may be four or five years before these enter seriously into the game of oil production, they are to be reckoned with, geologists and other special investigators say.

The same reasons for slow development in South America are advanced as to other countries with petroleum prospects, i. e., lack of transportation facilities. High grade oil, it is cited, has been found over a relatively large area in Colombia, but relatively little of it is reaching a market.

Facilities Are Lacking

Several of the larger companies are going about development in a most logical way. Caesar built roads before he undertook a great military campaign. Today oil companies are constructing transportation facilities before attempting real operations in South American oil districts.

Three large companies have established themselves in South America, and expectations are that development will begin on a much more extensive scale than has been the case heretofore. The amount of money placed in South Amrican petroleum development by these companies is shown as follows:

International Petroleum: New financing since January 1, 1919, $6,767,000; number shares, 1,353,401; present par value of stock outstanding, $13,534,000. Tropical Oil: New financing since January 1, 1919, $2,062,500; number of shares, 165,000; present par value of stock outstanding. Carib Syndicate: New financing since January 1, 1919, $1,176,000; number of shares, 738.

The merger of the International Petroleum Co., Ltd., a subsidiary of the Imperial Oil, Ltd., which is a subsidiary of the Standard of New Jersey, with the Tropical Oil Company, it is believed will have an important influence on South American developments within the next year. The consolidated companies which will control much prospective oil land in Colombia and Peru are expected to make great headway in these pioneer fields.

Doubtless many large companies have their eyes on South America and are "playing" geology—that is, they have set aside large sums of money for scientific study of the prospective oil fields of South America. Large tracts of land have been procured by several of the companies, and development likely will go forward at a rapid pace during the next twelve months.

The Rights of Americans

What are the rights of Americans in the different countries where prospecting is going on? This question was asked quite generally when the British-control-of-the-world's-oil bugaboo occupied the limelight several months back. A brief summary of the rights accorded Americans by the republics of South America is listed.

In Bolivia all oil lands belong to the government except those already legally taken up by private owners. There are no restrictions against aliens.

In Colombia aliens have the same rights as natives, where the alien national laws give reciprocal rights to Colombians.

In Ecuador a new law declares petroleum mines not adjudicated belong exclusively to the state.

In British Guiana none but British subjects are entitled to oil rights, and they cannot be transferred to aliens.

The governor of Trinidad and Tobago controls the issuance of title or interest in oil lands of those places.

In Costa Rica there is no distinction between natives and foreigners. While Dominican oil lands belong to the government, there is no distinction between natives and foreigners, but special permits are acquired for exploration and exploitation.

In Guatemala a law lays restrictions on the acquisition by aliens of petroleum lands. Ten year leases are given by the ministry of public works to natives or naturalized citizens, not transferable.

In British Honduras all mines of mineral oil are reserved to the crown.

The Lion Roars

Sir E. Mackay Edgar in his article appearing last spring in the London Times (Sunday), and dealing with what British interests are doing and have done in the way of obtaining concessions of prospective oil lands, had the following to say regarding Mexico, Central and South America:

"Apart from Mexico, it is almost a case of Britain first and the rest of the world nowhere. I should say that two-thirds of the improved fields of Central and South America are in British hands. In Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela and Ecuador, a decisive, a really overwhelming majority of the petroleum concessions are held by British subjects, and will be developed by British capital.

"The Alves group, whose holdings encircle practically two-thirds of the Carribean Sea, is a wholly British group, working under arrangements which insure that the perpetual control of its undertakings shall remain in British hands. No American citizen and no American group has acquired or ever could acquire any such acquisition in Central America as that which his enterprise and personality has acquired for Mr. Alvez."

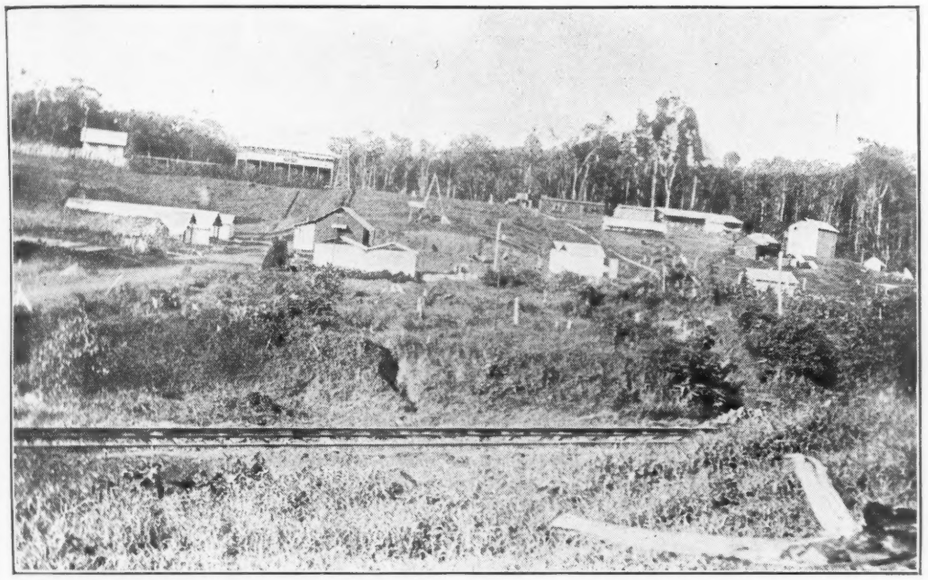
Peru has produced more oil than any other South American country, this country being reported by the United States Geological Survey as having produced 24,414,387 barrels between 1896, when the first oil was reported from that country, and 1918—1919 and 1920 figures not being available. For three years prior to 1918 and during 1918 the production of Peru amounted to approximately 2,500,000 barrels annually.

Next to Peru in the matter of oil production stands the Island of Trinidad. Its production now totals 7,429,534 barrels (not including figures for 1919 and 1920), the first oil being reported in 1908. Its

greatest year was 1919, when production topped the 2,000,000 barrel mark. Argentina has produced 5,296,093 barrels since 1907, when its first oil was reported.

A general review of the possibilities of South American fields is unnecessary. The different countries which have within the last two or three years made notable progress along the lines of oil field development are listed below. A comprehensive view of the Latin-American situation may be gained by a study of the facts presented under the heads of the various nations.

Briefly it may be said that the world is looking toward Mexico, Central and South America for a great part of the oil to supply future generations. Prospectors, geologists, investigators of all kinds who have visited South and Central America say that the oil is there.



VIEW OF TRINIDAD CENTRAL OIL FIELD, TOBIQUITE, BRITISH WEST INDIES.

Getting it is the next thing. There seems to be a merry race on between the world powers, notably Britain and the United States, as to what interests shall be supreme in this coming field. Whatever nation wins, it may be said that there is plenty of work to do. The mere drilling of an oil well is not half the story. Years of work must precede this step, and years more of labor must follow in order to put South and Central America in a position where the world at large will benefit from their mineral resources.

COLOMBIA

Possibly no country in South or Central America holds forth as much promise of becoming a factor in the world's oil production as does Colombia. With a present daily producing capacity estimated by some at more than 10,000 barrels, with geological reports all favorable, and with companies of some magnitude beginning development, none of the republics to the south offers a better opportunity for oil prospecting.

Seepages of petroleum in the river valleys first gained attention of investigators. At three widely separated points, as explained by C. K. McFadden, petroleum engineer, in a recent article, commercial yields have been discovered. These are (1) the coastal region, (2) Barco Area near the well recently drilled by the Colombian Petroleum Company, and (3) Barranca-Bermeja, known as the Tropical Area. Negative results may be expected from many portions of Colombia, but the same is true of every country.

Concessions of prospective oil properties held by Germans in Colombia have in the most part been taken over by British interests, and it may be said that the English prospector is leading all others in this republic. Americans are second in the efforts to get concessions.

Companies Operating

Colombian oil areas are practically unexplored, although numerous companies, including the Sinclair organization, the Tropical Oil Company (now merged with the International Petroleum Company), the Gulf Oil Company and the Transcontinental Oil Company are listed among the American interests which are making headway in Colombia.

The attitude of the natives and of the government is not at all hostile to American interests, although it was expalined by Charles T. Kirk of Tulsa, Okla., who visited the section recently, that there appears to be a sentiment in favor of British interests. He does not regard this as any handicap for American companies, however.

As in practically all virgin oil fields, the lack of transportation is holding back work considerably. Along the western part of Colombia north to south, are three ranges of the Cordilleras Mountains, of which the Rocky Mountains in this country are a branch. These are parallel to the coast line, and oil explorations so far have been in the valleys between. Because of the ruggedness of the mountains, it has been literally impossible to build roads across them, and the only way to penetrate the country is to go up the rivers which flow north. The Magdalena River and the Colarado River are the principal streams, and are navigable by river boats for considerable distances. Rapids on these rivers at intervals furnish another problem of transportation. The Atrato River near the western coast also is important as an artery of trade. No railroad enters the country from the coast.

Oil in the Plains Country

East of the three mountain ranges is a broad, flat plain stretching away 1000 miles toward the Atlantic Coast. It is practically untouched, with no transportation of consequence and few towns. It is believed this plain holds the future supply of oil in South America. So far it is untested, but its geology is more favorable than the mountain regions where oil has been found. And Colombia is especially peculiar in that so far as drilling has been carried on, oil production absolutely agrees with geologic structure.

The only practical way of entering this plain with transportation would be to build in from the Carribean Sea. Railroads across the mountain ranges would be well-nigh impossible. It is reported that a party of engineers already have been surveying a route from the northern coast. This would connect the interior with some city on the coast, near the Atlantic side of the Panama Canal. Just what will be done along this line has not been determined, although it is generally recognized that adequate transportation is the next step if oil developments proceed as they should.

It is estimated by Mr. McFadden in his article above mentioned that a total of 15,000 feet of test hole have been completed in Colombia, and as a result wells having a daily producing capacity of more than 10,000 barrels have been found.

The government of Colombia requires a 10 per cent tax on all oil produced within a distance of 200 kilometers of the coast; 8 per cent on all production within the next 200 kilometers, and 6 per cent on the oil produced in the interior. This is in addition to a royalty to the property owner, where leases are taken on property that is under private ownership. There was several months ago much government land yet unclaimed, but this was being rapidly taken up.

Laws Considered Unfavorable

The petroleum laws of Colombia, as explained by the United States Bureau of Foreign Commerce, while making the provisions for the exploration and exploitation of petroleum lands somewhat more liberal than older laws, still are not encouraging to foreign capital. Briefly the objections are listed as follows: Rate of taxation too high; classification of zones by a straight line instead of actual routes of traffic; area permitted any one company too small; too much discretion vested in executive officials of government; right of government to cancel leases at will, and too short period of lease; and all technical data procured by companies must be delivered to the government.

In the opinion of many petroleum experts, the present laws of Colombia may prove a drawback in its development, except the lands held under old concessions not affected by the new laws.

Transcontinental's Holdings

The Transcontinental Oil Company, general offices in Pittsburgh, Pa., is largely interested in Colombia and at the present time has some 2,000,000 acres of territory that extend from the head of the Magdalena River to its mouth. These tracts have been passed on by the company's geological department as being most favorably situated for oil. Some of the largest seepages of high grade oil ever found are located on their property.

This company has holdings north and south of the Tropical Oil Company's property, and is at present drilling a well on a 200,000 acre tract near the town of Honda on the Magdalena River. It has two other wells starting, one north of Honda and one south, both in the Magdalena valley. The Transcontinental people are building roads and camps in this valley and material is being hauled in.

T. R. Cowell, secretary of the Transcontinental Company, recently announced that a deal had been closed with the Latin-American Petroleum Corporation of Colombia, which company owns concessions covering the entire municipalities of Carman and San Jacinto, lying between the Magdalena River and the coast. There are 600,000 acres in these municipalities, and seepages of high grade oil have been found diagonally across the prop-

erty. The company intends to start operations on this tract at once.

Headquarters for Transcontinental operations have been established on the upper river at Honda, where camps, warehouses, roads, etc., have been built. Operations in Colombia are under the supervision of Frank M. Kiser, who has had years of experience in drilling in Mexico and Colombia. J. S. Sidwell, general superintendent of the Penn-Mex Company, has general supervision of Transcontinental's drilling operations in Colombia as well.

Tropical Oil Company

The territory adjacent to the Magdalena River in Colombia has long been recognized as being rich in deposits of petroleum. Producing and refining of oil, however, started in that section less than four years ago when the Tropical Oil Company invaded the territory for the purpose of development.

This company has oil rights on about 2,000,000 acres of land in Colombia, located about 350 miles inland and up the Magdalena River. The Colombian government has recognized the title of the company to the oil rights. The company thus has been able to follow out a development program unhampered.

It is understood that the original concession called for a participation ot the government in 15 per cent of the net product, whereas the new agreement allows the Colombian government 10 per cent of the gross product of crude at the wells, the company agreeing to build a refinery of sufficient capacity to supply domestic requirements, and to sell crude oil and refined products at the refinery for Colombia at prices not to exceed the market price in New York.

The country in that section is largely jungle land which had to be cleared before operations were considered under way. The Magdalena River, however, is one of the principal arteries of commerce and shipping facilities are aided by its possibilities, the river being navigable for 900 miles or more.

An active campaign by the Tropical will doubtless be under way in the near future. W. S. Smullen, formerly vice president of the Humble Oil & Refining Company, left the States about two months ago to make an investigation into the operations heretofore undertaken by the Tropical in Colombia, and it is expected that a drilling campaign will be undertaken very soon. The Tropical has three wells capped on its properties in the Novena Santandra, estimated as being good for 5000 barrels each. It is light oil. It is proposed to build a pipe line from the present production to the Magdalena River, and to handle the oil down the river by boats, barges, etc. With this idea in view, a substantial organization is being built for service in Colombia.

DRILLERS' MESS, TRINIDAD. NOTE THE SIDEBOARD AND CONTENTS—HOW MESSY!

Sinclair in Colombia

A brief mention of the Sinclair Company's holdings in Colombia is made in a supplement to the company's magazine, issued last April, as follows: "In Colombia, South America, the company is active in its geological work and is securing from time to time right to oil and gas leases on various tracts in the promising parts of the Colombian oil districts."

"Substantial" holdings of Colombian oil properties of considerable prospective value are reported by the Atlantic, Gulf & West Indies Company, according to a report made recently by President Nicol. The president was of the opinion that it might take three or four years to develop these properties, which comprise more than one million acres.

Considerable holdings of the Carib Syndicate, Ltd., in Colombia are being developed by the Colombian Petroleum Company, which has placed a selected development organization and complete drilling equipment in the field. This company, it is reported, also is linked up with the Doherty interests.

Aside from its interest in this company, the Carib Syndicate is thought to own outright or at least control approximately 2,000,000 acres additional now in the process of development. This company recently purchased properties of the Equatorial Oil Company which had 250,000 acres in Colombia adjoining properties already exploited by the Tropical Oil Company. The Carib Syndicate owns its own drilling and exploration equipment and water transportation facilities.

"POSO" NO. 2, TROPICAL OIL CO., IN BARRANCA BERMEJA, COLOMBIA.

ARGENTINA

Argentina recently refused an offer by the Cowdray interests of England for control of the government's petroleum producing properties. It is said that the amount offered was 10,000,000 pounds. Other offers, some made by promoters living in the United States, have been refused from time to time.

Increased production on the government's holdings is necessary because of an impending fuel shortage. The yearly production heretofore has been 200,000 tons or approximately 1,400,000 barrels. While recognizing the importance of an increased production, President Irigoyen is not willing to allow control of the properties to pass from the hands of the people of Argentina.

Changing policies on the part of the government are already evident by the several concessions recently granted to a group of private persons for the exploitation of more than 6000 hectares (around 15,000 acres) of petroleum land in the Comodoro Rivadavia district. Three railroads recently made a contract with a private company owning oil acreage in this district, for extensive development.

The Compania Argentina de Comodoro Rivadavia, a private enterprise, recently entered into a twenty year contract with the Western, Southern and Pacific, all British owned, for the development of its properties. This contract provides for an annual payment of $150,000 Argentine paper and 12½ per cent of the gross yield. The railroads have the option of prolonging the life of the contract. A minimum of twenty wells are to be drilled during the first three years, and more annually thereafter.

"Given the present cost of the wells," the newspaper La Nacion says, "the railways will have to expend—in order to comply with the terms of the contract—at least $10,000,000 Argentine paper in drilling. If to this be added piping for petroleum gas and water; buildings; extension of workshops; tank, steams, etc., a sum of $15,000,000 Argentine paper is easily arrived at. The arrangement is a very beneficial one since the railways referred to required for their consumption not less than 600,000 tons of petroleum per annum, and they will have to intensify the production so as to arrive at this figure, thus freeing the country of the heavy tribute paid annually to foreign countries in order to obtain fuel for its industries."

These railroads are at present buying wood, due to the impossibility of obtaining coal, but some time ago voted to adopt oil combustion.

Official figures on importation of oil into Argentina during the year 1919 recently were made public, and show some large increases. The total value in 1919 was $19,000,000 gold against $10,800,000 in 1918. In 1918 71,000 kilograms of gas oil were imported, while in 1919 this figure was increased to 3,520,000 kilograms. Importations of "petroleum," a general term including lighter oils, increased from 1,810,000 to 3,940,000 kilograms; and heavy oils for fuel and refining increased from 10,650,000 to 329,000,000 kilograms. It may be seen from these figures that Argentina has some development ahead before she will be able to supply a demand now fed by imports.

About the middle of May the government enterprise at Plaza Huincul and Comodoro Rivadavia completed wells, one of which was rated at more than 7000 barrels a day and the other at better than 3600 barrels a day. These are the first big wells ever completed in the republic.

Petroleum Report Given

In its May (1920) report of business conditions in Argentina, Ernesto Tornquist & Cia., Limitada, had the following to say regarding petroleum:

"The new borings recently completed on the oil fields worked by the government of the nation have given very satisfactory results both at Comodoro Rivadavia and Plaza Huincul (Territory of Neuquen).

"This notwithstanding the working of the petroleum at Comodoro Rivadavia during the first four months of the current year resulted, owing to strike movements, in a smaller output than was obtained in the same period last year.

"The output of petroleum at Comodoro Rivadavia has been as follows (in cubic meters):

Month—	1919	1920
January	19,300	8,700
February	15,300	12,100
March	16,100	13,400
April	15,100	16,600
Totals	65,800	50,800

"Selling prices of Comodoro Rivadavia petroleum have been fixed by the Ministry of Agriculture as follows:

"$115 paper per ton in cistern-wagons, tank-carts, etc., provided by the purchasers.

"$117 paper per ton in irons drums of from 200 to 600 litres, provided by the purchasers.

"$120 paper per ton in iron drums provided by the petroleum board.

(Note.—$10 U. S. A. is equivalent to $23.55 paper.)

"These prices rule as from June 1, 1920, and are for delivery of the petroleum at the depots of the government at Buenos Aires.

"During the last few months, some new petroleum manifestations have been discovered in the territories of Neuquen and La Pampa, but it is as yet impossible to express any opinion as to their value."

Wells Less Than 2000 Feet

The depth of wells in the Comodoro Rivadavia district ranges from 1725 to 1855 feet. The crude oil ranges in specific gravity from 0.940 to 0.922 (18.9 to 21.8 degrees Beaume), and on distillation yields from 1.5 to 3.5 per cent of naphtha and gasoline, 15 to 19 per cent illuminating oils, and 77 to 85 per cent of lubricants, fuel and coke.

Oil from this field is transpotred by two pipe lines to a topping plant on the ocean front, and eventually to storage tanks which are connected with loading racks on a long wharf, constructed several years ago. The oil is transported by tank steamers to Bahia Blanca and Buenos Aires, where it finds a ready market for fuel.

A fuel stringency in Argentina was brought about when coal imports from England ceased at the beginning of the European war. Since this time the Comodoro Rivadavia oil section, which is located in the Territory of Chubut, has been called upon for fuel oil in quantities which it could not supply. Large quantities of imports have been the result.

In 1916 there were 21 wells in the Comodoro Rivadavia setcion capable of producing oil. At the end of 1917 there were 39 producing wells in this district. No later figures are at this time available.

The ministry of agriculture of Argentina has been allowed 250,000 pesos for the purpose of exploiting the petroleum fields recently discovered in Plaza Huincul, south of Buenos Aires.

PANAMA—CORDUROY ROAD FROM COMMENCEMENT OF JUNGLE TO WELL LOCATION WHICH IS ONE MILE Photo Courtesy Sinclair

VENEZUELA

A number of strong companies have been interested in oil development in Venezuela for several years. The Carribean Petroleum Co. and the Colon Development Co. are the pioneers in the field, although some work has been done by the Doherty interests, the Royal Dutch-Shell group, and the Venezuela Oil Concessions, Ltd., have been active for the past several years.

Developments in Venezuela in 1915 indicated that that country would soon be recognized as a real producer of oil for commercial purposes. Progress in the fields since that time has upheld this contention. The Venezuela Oil Concessions, Ltd., in that year disposed of its concessions covering approximately 3000 square miles in the districts of Maracaibo and Bolivar, state of Zulia, to the Royal Dutch-Shell group. This interest later constructed a modern refinery at Curacao, one of the Leeward Islands off the north coast of Venezuela. At that time four wells had been drilled by the Venezuela Oil Concessions, Ltd., all having showings of oil and gas. In 1918 the Royal Dutch-Shell group produced approximately 400,000 barrels in Venezuela. During 1919 the production was about 300,000 barrels.

The Carribean Petroleum Company's operations were in the Sucre district, on the eastern side of Lake Maracaibo. This prospecting was in the Mene Grande field on Matatan River, and a six-inch pipe line fifteen miles long was constructed from the field to San Lorenzo on the lake, and storage tanks were erected at the terminals of the line. The wells numbered six at the time this line was constructed, and a capacity of from 300 to 400 was credited them. Oil also was had in a 1227 foot test in the Perija field, 50 miles west of Lake Maracaibo.

Refineries in Operation

Two refineries were reported in Venezuela by Consul Emil Sauer. These included the Carribean Petroleum Company's 2000 barrel plant at San Lorenzo, and a refinery erected by the Curacao Petroleum Company at Curacao. This plant is now running to capacity, crude being received from the company's wells

SLATER STEEL RIG CO
BOLTLESS
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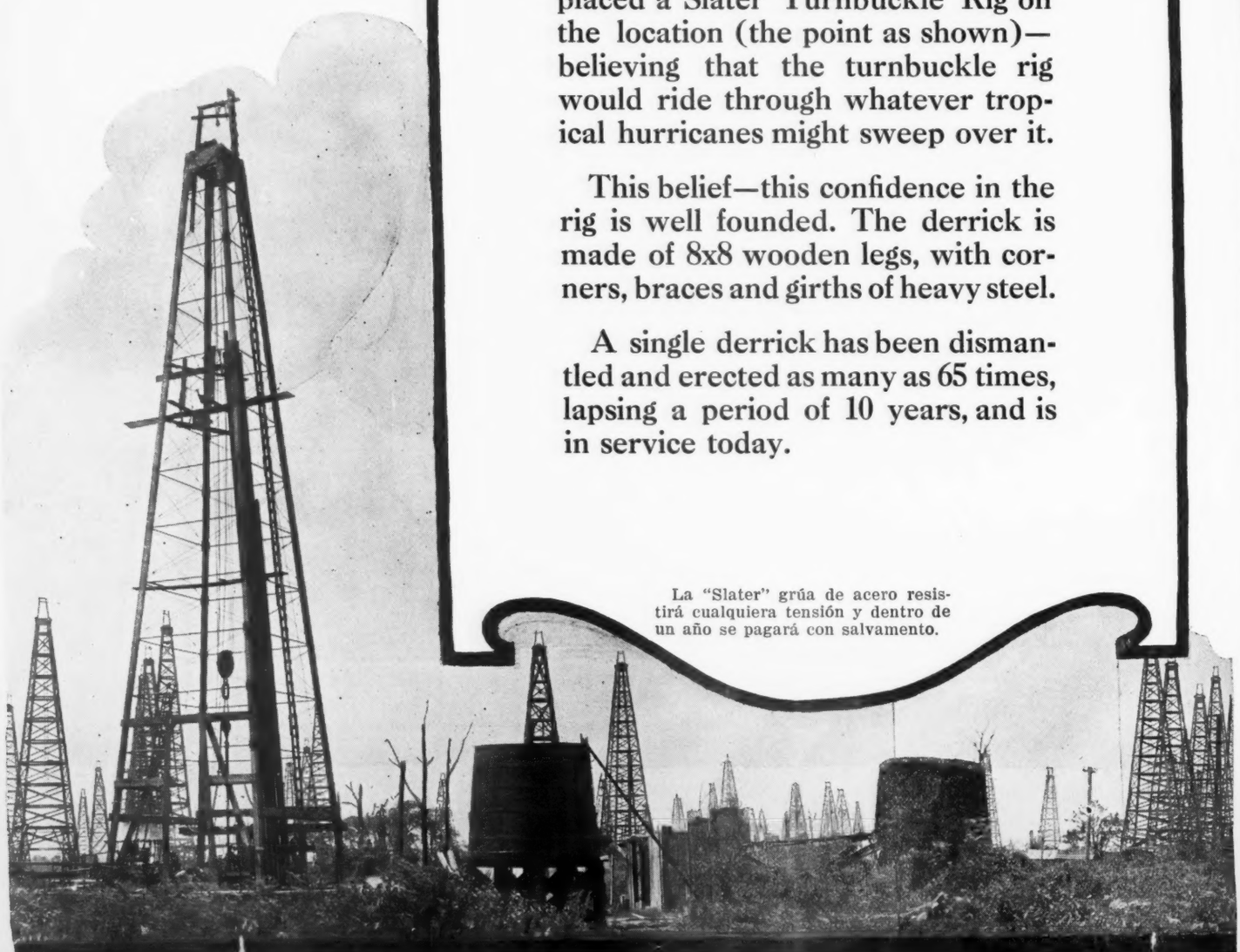
WHEN one of the major producing companies started drilling a test on an exposed point near the Gulf of Mexico, with the intention of making it an especially deep well, it placed a Slater Turnbuckle Rig on the location (the point as shown)—believing that the turnbuckle rig would ride through whatever tropical hurricanes might sweep over it.

This belief—this confidence in the rig is well founded. The derrick is made of 8x8 wooden legs, with corners, braces and girths of heavy steel.

A single derrick has been dismantled and erected as many as 65 times, lapsing a period of 10 years, and is in service today.



La "Slater" grúa de acero resistirá cualquiera tensión y dentro de un año se pagará con salvamento.

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YOU have 100 per cent salvage in a Slater derrick when you have finished your well, whereas the ordinary derrick has a salvage value of only about 50 per cent.

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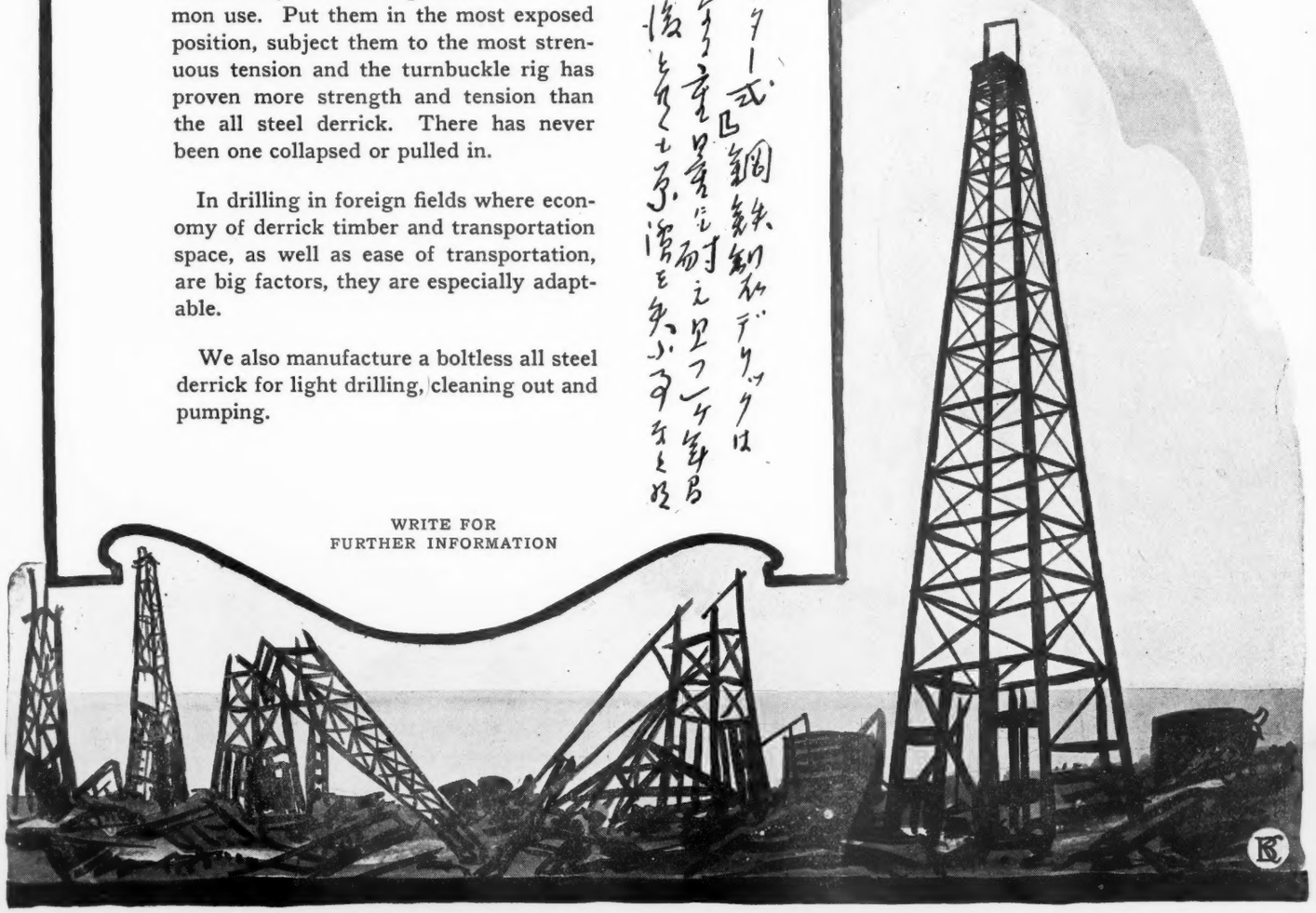


STEEL RIG CO.
TULSA, OKLA.

in Venezuela. Some Mexican product also is being handled. It is thought that 5000 gallons of gasoline daily will soon be turned out by the refinery, the product being sold in the West Indies and northern part of South America. The cost of this company's refinery has totaled more than $2,000,000. One thousand men are employed. The crude oil is transported in barges from Lake Maracaibo.

The Doherty interests have approximately 1,000,000 acres, the majority of which is located on the Venezuela-Colombia line. This company advised The OIL WEEKLY recently that its operations on these properties have been progressing very slowly. The South American manager for Henry L. Doherty & Co. is due in New York the latter part of this year.

Fully a quarter interest in the Colon Development Company is controlled by the Carib Syndicate, Ltd., which also holds extensive concessions in Colombia. Other blocks of shares in this same company are controlled by the Royal Dutch-Shell group. The Colon Company holds 4,500,000 acres of oil and prospective oil lands in Venezuela. A number of wells already have been completed, and the oil produced has a right paraffine base. Further and extensive developments of these properties are being planned at this time.

Another British Outfit

The Buchivacoa concession, comprising between 6,000,000 an 7,000,000 acres of prospective oil land in the state of Falcon adjoining the properties of the Venezuelan Oil Concessions, Ltd., will be developed by British interests, known as the Bolivar Concessions.

The Venezuela Oil Fields, Ltd., a company recently organized in Delaware, has just acquired five concessions in the state of Falcon. It was declared that transportation was less difficult in this section than in other parts of Venezuela, and that if production is obtained a pipe line will be constructed to the coast and a jetty built out to deep water.

By far the most promising of prospective oil fields of Venezuela are in the states of Zulia, Merida and Trujillo.

In 1918 Venezuela produced 190,080 barrels of oil. Since starting oil production on a commercial scale this republic has produced 317,823 barrels.

PERU

Oil in Peru is an old story, and while production surpasses that of any other South American country, deevlopment is not nearly so interesting because it has passed the pioneer stage. Peru's production averages 2,500,000 barrels yearly. Since 1916 there has been a slight decline in the amount reported each year.

It was back in 1870 when the first oil work was done at Zorritos. This field lies a few miles south of Tumbez and is controlled by Fausto G. Piaggio of Callao. Its output is handled by a local refinery, and is sold in cities along the west coast of South America.

The bulk of Peruvian production comes from the Negritos district, six miles south of Talara. At Talara the International Petroleum Company, Ltd., has a refinery with a daily capacity of 2500 barrels. This soon will be supplemented by a new 5000 barrel a day plant. Loading piers have been constructed to care for the shipment of crude oil. The crude production of the International totals about 7000 barrels a day. This likely will be increased following a merger of the International and the Tropical companies.

The Negritos and Lagunitos fields have shown a decrease in production for several years back. At the end of 1917 there were almost 700 producing wells in these areas. The Lagunitos field is 12 miles south of Talara and is connected with it by a pipe line and a narorw gauge railroad.

Two Sands Found

Two sands, the upper between 1100 and 1400 feet and the lower between 2000 and 2500 feet, produce oil in the Lobitos district, which is located about 12 miles north of Talara. There are approximately 200 producing wells here, most of them being controlled by the Lobitos Oilfields, Ltd., of London. This company also has considerable holdings in Ecuador.

It is reported that the International Petroleum Company, Ltd., subsidiary of the Imperial Oil, Ltd., subsidiary of the Standard of New Jersey, has contracted for the purchase of the 1921-23 (inclusive) output of the Lobitos Oilfields, Ltd., in Peru. As the Lobitos Oilfields, Ltd., heretofore controlled most of the production not procured by the International, this gives an American company practically all Peruvian production.

A law enacted in 1917 establishes a progressive export tax on crude petroleum and petroleum products such as lubricating oils, benzine, gasoline, kerosene and other light distillates.

Peru's production, by years, may be found in the statistical section of this edition, on page 99.

BOLIVIA

Seepages on the lower foothills of the eastern side of the Andes called attention to the oil possibilities in Bolivia. Marked anticlines were present in connection. These manifestations have been most evident in the country lying to the west of the Santa Cruz-Yacuiba trail. The oil district of Santa Cruz-Chuquisaca-Tarija follows the general direction of this trail along the adjacent foothills of the Cordillera.

Natives bail seepage oil from holes and put it to various uses. From the city of Santa Cruz the general direction of the field is toward the northwest, roughly paralleling the main chain of the Andes and the Pacific coast. Oil has been found in the Beni district, the province of Caupolican (lying in the department of La Paz and west of the River Beni), and in several sections between the valley of the Tuichi and that of the Madidi.

A minor field, that of Calacoto, is located in the province of Pacajes, department of La Paz, along the line of the Arica-La Paz railway. It is at an altitude of more than 12,000 feet.

The problem of transportation, as in other undeveloped countries, is the chief obstacle which must be overcome by companies intent upon development. It was reported early in 1920 by W. L. Schurz, trade commissioner from the Department of Commerce, that concessionaires had plans under way for the construction of railways. Inland waterways also will be utilized for shipment of oil.

Concessions for Speculation

The first oil development of any kind in Bolivia began in 1906, when a number of smaller claims were acquired and registered. No real development came of this, however, as the land had been taken up more for speculative purposes than anything else. In 1912 a Bolivian oil company was formed and it spent large sums in surveying extensive properties in the department of Santa Cruz. The OIL WEEKLY is informed the holdings of this company later passed into the hands of the Sindicato Petrolifero del Oriente Boliviano, which was formed about that time by Chilean capitalists. This syndicate proposed to exploit an area of 1,345,150 acres in eastern Bolivia and had plans to raise $10,000,000 to carry on the work. Oil was being sought especially by nitrate producers in Chile, who were anxious to procure an adequate and economical supply of fuel. This company, until Americans entered the field, held the stage alone.

Several American companies, two British concerns, and the Chilean syndicate have holdings in Bolivia at this time. Actual drilling, it is believed, is not far off.

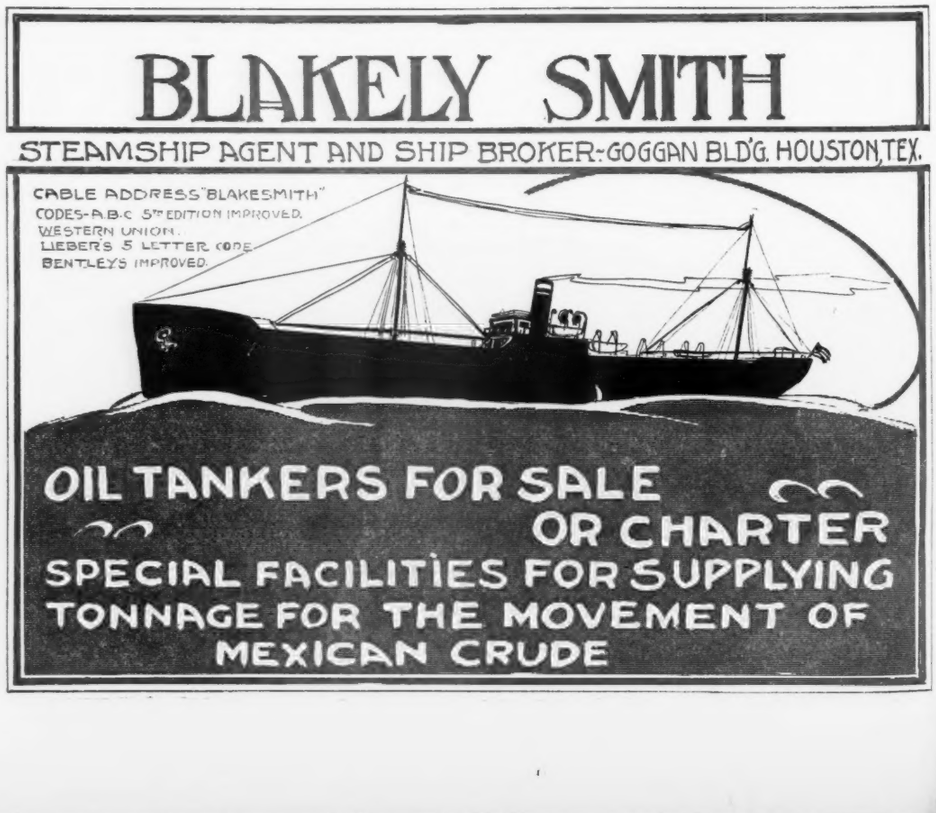
William Braden, an American oil man and geologist, is reported to have procured an option on 5,000,000 acres in Bolivia. This land is in the southeastern part of Bolivia, and prospects for petroleum production are promising.

Expropriation Right Retained

In granting concessions to oil companies, the Bolivian government retains the right to expropriate the oil land to such an extent as may be deemed necessary to supply the domestic demand for oil, twenty years after date of contract. At the termination of 50 to 66 years of working by the concessionaire, such oil lands as may not have been expropriated shall revert to the Bolivian government.

A yearly tax per hectare is required of con-

(Continued on page 232.)



MEXICO HER PAST AND HER PRESENT

By Rolland Welch

WITH the increasing interest and growth of oil development in Mexico, many persons have been anxious to obtain a short history or resume of the petroleum industry of that country, including the principal wells of Mexico —which, in point of production are the largest in the world—the discovery wells and dates of the Mexican oil fields, figures on production, exports, imports and refinery activities, geological condition of the country, and the strength, production, and holdings of the various large companies now operating in that land. Such a story has been gotten up herewith from the files and previous issues of The OIL WEEKLY and through personal research.

Although it was not difficult to find oil indications in Mexico—crude came bubbling from the surface of the land and formed great lakes of semi-solid asphalt and oil which the natives used for fuel centuries ago—it is an interesting fact that oil was not found or used in commercial quantities until about 1909. In face of the fact that Mexico now exports the second largest amount of crude oil of any country in the world, a subsidiary of the Standard Oil Company of New Jersey built a refinery in Mexico, exported crude oil from the United States to Mexico, refined it there and sold the products in that country no longer ago than 1909 or 1910. In fact Mexico, with its vast quantities of hidden supply, looked to the United States for petroleum and petroleum products at that time.

Mexico To the Fore

And now after only ten years of development under most difficult obstacles imaginable—lack of transportation, equipment and proper facilities, menace of tropical disease, revolutions and an everlasting unsettled and ever changing political condition—Mexico has become the second largest oil producing country in the world and from the figures of exports during the present year that country promises to surpass the United States which has stood first in production for years. The oil industry of the world now looks to Mexico to produce—perhaps through its numerous wildcat tests dotting the country—other sources of production which will avert the possible crisis of petroleum shortage caused by lack of production and heavy demand.

The earliest records of the petroleum production of Mexico are to be found in the writings of Bernerdino Sahuagan and some of his books dealing with the oil possibilities of "Chapopote" in the early centuries are still to be found in the book markets of Mexico City. One of the first wells of which there is any record was drilled in 1869 in what is now known as the Furbero district. This well reached a depth of only 125 feet and, so far as is known was a failure. From 1880 to 1883 several more wells were drilled, two of which were at Chapopotal, near the world famous Potrero del Llano well of the Mexican Eagle Oil Company, about which more will be said later in this article.

Shallow Wells Unsuccessful

The wells drilled during the time stated above were owned by an American concern organized in Boston and as none of them reached a greater depth than 400 feet they were likewise unsuccessful. A number of other unsuccessful attempts were made by various companies between 1885 and 1900. During this period 24 unproductive wells were drilled in the state of Vera Cruz. But deep drilling—and ultimate production—was practically unknown until 1901 when the Doheny and Canfield interests of California entered Mexico. In this year these interests drilled the first Mexican producer in the Ebano field some 50 miles west of Tampico. Figures on the initial production or life of the well are unobtainable.

In the same year of the discovery well of Mexico other companies began drilling in Furbero and three years later, in 1904, the first successful well of that field was drilled in. Drilling operations gradually increased and in 1907 the Huasteca Petroleum Company began drilling in Juan Casiano and Tres Hermanos and finally became one of the strongest companies operating in Mexico. In 1905 the Pearson interest of England succeeded, after considerable difficulty, in bringing in the San Cristobal field located in the Isthmus of Tehuantepec and later they established a refinery at Minatitlan.

In 1908 the discovery well of the Dos Bocas, San Geranamo pool (San Diego No. 2) was drilled in. A month later, on July 4, Mexico's famous San Diego No. 3, known as "The Dos Bocas Well," came in and almost immediately caught fire. Every effort was made to extinguish the fire, but the oil burned until salt water came in. Within two months time it is estimated that more than 10,000,000 barrels of oil were destroyed. Hot salt water began flowing from the well when the fire went out, and by the end of September, 1908, it is estimated that the well had produced 14,000,000 barrels of salt water. Finally the well caved in, forming a crater half a mile wide about the well. This well was located 50 miles south of Tampico and two miles from the Tamaihua Lagoon, or ten miles from the Gulf of Mexico. Drilling on the Dos Bocas well began in April, 1908, and it was completed on July 4 at a depth of 1824 feet.

Large Wells Brought In

The following year, in 1909, drilling began in Potrero del Llano and Juan Casiano, following the discovery of the Topila and Chijol pools. In 1910 the Panuco, Tanhuijo and San Pedro fields were discovered, and this year also saw the completions of two of the largest wells in the world. One of them, the Huasteca Petroleum Company's No. 7 Juan Casiano, was completed on September 11 and began to produce such a tremendous quantity of oil it was feared another Dos Bocas blowout would occur. For this reason the well was throttled and the flow limited to about 25,000 barrels daily. For ten years this well flowed at the same rate and produced more than 56,000,000 barrels of oil of 19.4 degrees Beaume gravity before it exhausted itself.

The Potrero del Llano well mentioned above as having started drilling in 1909, was brought in during December, 1910, and produced more oil than any other well ever brought in up to that time. Since that time there has been but one other well of like production. This is the Huasteca Petroleum Company's famous well at Cerro Azul, which came in with an initial production of approximately 286,000 barrels. Further mention of this will be made. When the famous Potrero del Llano well came in it broke loose and flowed free for two months, with a production conservatively estimated at 110,000 barrels a day. It was finally capped in 1914, but the pressure was so tremendous that oil broke through the surface of the ground and began leaking in numerous seepages. About 11,000 barrels a day were recovered through seepages alone during the lifetime of the well, and about 19,000 barrels a day were picked up from leaks where the well had been capped. During this period the well flowed 20,000 barrels a day through the pipe line. In August, 1911, the well caught fire and burned for three months before being extinguished and capped. Before the pool was invaded by salt water in December, 1919, the well produced more than 70,000,000 barrels of oil. The field and all its wells went to salt water in 1918, and operations ceased, the holes being plugged. The Huasteca Petroleum Company is now drilling one well in that field. The operations can be found in the weekly drilling report in The OIL WEEKLY.

Alamo Field Is Proven

After the erection of the first pipe line in 1910, drilling continued, and in 1913 the Penn-Mex Fuel Oil Company drilled in two good wells in the Alamo field, west of Tuxpam and south of Potrero del Llano. On October 28 of the same year the discovery well of Los Naranjos (Naranjos No. 1 of the Mexican Eagle Oil Company) was brought in with an initial production of 50,000 barrels, 22 gravity, and the year following saw the completion of its second big producer, Naranjos No. 4, in the same pool. The combined production of these two wells was estimated at approximately 150,000 barrels a day. But, due to the fact that the Mexican Eagle Oil Company already had more oil shut in than it could market, these wells were never allowed to flow. In January, 1914, La Corona Petroleum Company brought in a gusher in the Panuco field with a capacity estimated at approximately 110,000 barrels a day.

Due to unsettled political and economical conditions all over Mexico, in August, 1914, following the outbreak of the European war, operations in Mexico virtually ceased. Some

of the more firmly established companies, however, continued to operate a few strings of tools, and in February, 1916, the Huasteca Petroleum Company brought in its second famous well at Cerro Azul. The well came in with such pressure (1000 pounds to the square inch) that the cable was blown through the flow line and the tools were sent high into the air, demolishing the derrick. The well flowed unchecked for 80 days, at which time it was capped. Its capacity, as given out by the company, was 260,000 barrels a day, and it is still producing around that rate. In May, 1917, the Metropolitan Petroleum Company drilled in a producer in the Tepetate field estimated at 60,000 barrels a day. On May 20, 1917, the Huasteca Petroleum Company's No. 1 lot 164 Chinampa, came in for 50,000 barrels a day, 22 gravity. This well went to salt water in December, 1919. The Mexican Eagle Oil Company's No. 1 Chapapote, in the Chinampa district, was completed June 3, 1918, with an initial production of 50,000 barrels from 1951 feet. This well began drilling April 4, 1918.

Operations Slowed Up

During the latter part of President Carranza's regime, drilling virtually ceased. A law was passed forcing companies with holdings in that country to be incorporated under the laws of the Mexican government or be operated by Mexican citizens, native or naturalized. No well was allowed to be drilled unless the company in charge first obtained a permit, and it required much effort to obtain this official sanction. Then came an exceedingly high export duty which worked a hardship on the companies, and export figures slumped.

Since Carranza's overthrow, however, a more friendly feeling on the part of the government has been evident, and drilling operations have been more active than during any year since the first well blew in. A continuation of this official co-operation and friendship will do more toward making Mexico the leading oil country of the world than any other one thing.

The completions in the Mexican oil fields from January 1 to October 1, 1920, were as follows:

Month, Company and Well, District	Depth	Initial Prod.
January—Meridional's No. 3 lot 6 Isleta	....	500
March—Buckley et al's No. 1 lot 114 Chinampa	2100	20,000
March—Mexican Sinclair Corp.'s lot 251 Amatlan	2000	3,000
April—Metropolitan Pet. Co.'s No. 3 Chinampa	2300	20,000
April—Mexican Texas Co.'s No. 1 lot 114 Chinampa	2011	30,000*
June—Island Oil & Transport Co.'s No. 1 lot 145 Chinampa	2000	60,000
June—Cia Metropolitan de Oleodustoa lot 135 Chinampa	2000	60,000-100,000
July—Mexican Gulf Co.'s No. 3 lot 251 Amatlan	2000	60,000
July—International Pet. Co.'s No. 3 Amatlan	....	15,000†
July—Mexican Texas Co.'s No. 4 Obando	2000	25,000
July—Cia. Inversiones de Aztlan's No. 1 Dominguez, Tanchicuin	2200	15,000
July—Union Oil Co.'s No. 1 lot 114 Chinampa	2080	100,000
August—East Coast Oil Co.'s No. 414 Willis, Panuco	2165	15,000
August—El Aguila Co.'s No. ? Los Naranjos	....	50,000
August—Mexican Sinclair Corp.'s No. 1 lot 114 Chinampa	2100	75,000
August—Empire Gas & Fuel Co.'s No. 1 lot 114 Chinampa	2100	75,000
August—Union Oil Co.'s No. 1 lot 114 Chinampa	2100	42,000
August—Los Perferadores Co.'s well on Robles Lease, Panuco	....	2,000
August—New England Fuel Co.'s No. 3 Pazzi, Panuco	2035	20,000
August—La Espuela's No. 2 Robles, Panuco	2367	1,200
August—La Espuela Oil Co.'s No. 1 Sebrevilla, Panuco	2495	‡
August—National Oil Co.'s No. 2 Herradura, Panuco	2420	‡
August—English Oil Co.'s No. 3 Rivera, Panuco	2480	‡
September—International Petroleum Co.'s No. 3 lot 252 Los Naranjos	2000	40,000
September—Transcontinental Petroleum Co.'s lot 134 Chinampa	2000	55,000

*Made 75,000 bbls when tools were taken out. †Through control head. ‡Salt Water and Abandoned.

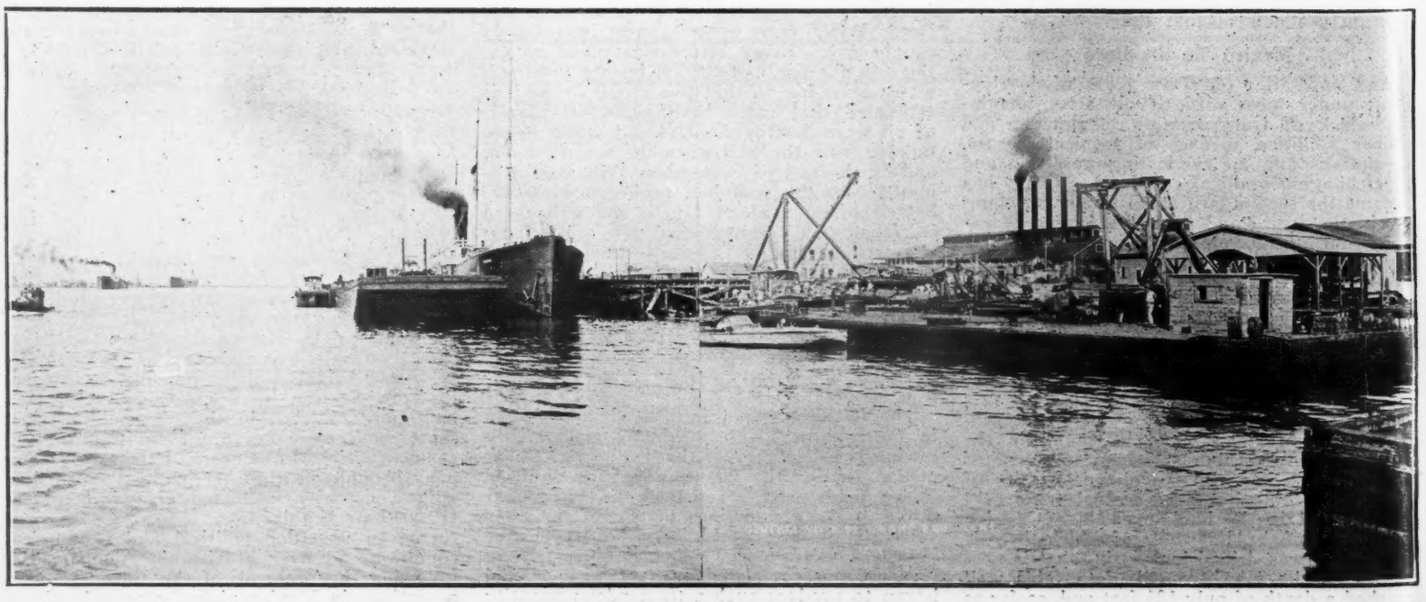
Holdings of Companies

As to the holdings of the various companies operating in Mexico, the Huasteca Petroleum Company, one of the largest, has 1,400,000 acres of proven and prospective oil lands. This figure was recently reached when the company acquired a 45 year lease on 800,000 acres, 750 acres of which lie at the north and adjacent to its present holdings in the state of Tamaulipas.

The Mexican Eagle Oil Company, one of the first and now one of the foremost companies operating in Mexico, holds five concessions which expire about 1960, giving the company exclusive right to drill for oil on all the national and vacant lands of the federal government in the states of Vera Cruz, San Louis Potosi and Tamaulipas. (The right to exploit the state lands of Tamaulipas is preferential and not exclusive.) This territory extends over 75,000 square miles and is situated north and west of a line from the city of Vera Cruz to Puerta Angel on the Pacific Coast. This company was formerly known as the Pearson Interests of England, which interests still play an important part in the company's affairs. Besides the state lands rights, the company holds leases on 200,000 acres of selected oil lands in the state of Vera Cruz between the Tamesi and Tuxpam Rivers. The royalties amount to about 9 d. per ton of crude, payable in English coin. Besides the oil lands, the company has a freehold on office property in Mexico City, and freehold land at Vera Cruz and Tuxpam for tank storage.

More Shipping Facilities

The Atlantic Lobos Oil Company holds leases on approximately 200,000 acres of land in Tuxpam and Tampico. The Island Oil &



GENERAL VIEW OF WHARF AND PLANT OF FREEPORT MEXICAN FUEL OIL CORPORATION, SINCLAIR SUBSIDIARY AT TAMPICO, MEXICO

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Say you saw it in THE OIL WEEKLY

Transport Company holds leases in Tepetate and Chinampa, and has a tide water terminal embracing about 225 acres of land. A second sea loading terminal now nearing completion will give the company a shipping capacity of more than 1,500,000 barrels of oil a month. The Mexican Gulf Company holds leases on about 40,000 acres in the San Isidro section and along the Panuco River. It has recently acquired some holdings in Zacamixtle, famous at the present time for its "likely" wildcat tests.

The Mexican Sinclair Petroleum Corporation holds leases on more than 150,000 acres of land. It owns the capital stock of the Freeport and Mexican Fuel Oil Corporation, and the issued stock of the Tampico Fuel & Oil & Transport Corporation.

The Texas Company of Mexico has about 17,000 acres at Tamboyoche; Isleta, in the Panuco field, and in Tepetate and Chinampa in the southern fields.

The Mexican Petroleum Corporation has about 600,000 acres of land, nearly 80 per cent of which is owned in fee, and terminal properties at Tampico amounting to more than 1000 acres, with storage capacity for more than 10,000,000 barrels of crude oil.

National Oil Company's Holdings

The National Oil Company has more than 36,000 acres under lease in Panuco, Topila and the southern fields. The New England Fuel Oil Company holds a 30-year lease on nearly 1500 acres in the Panuco district, and about 50 acres in the Topila field, besides a lease on more than a thousand acres along the Tamesi River. About 675 acres of the company's holdings in the Panuco field and about 25 acres in the Topila field have been sub-leased to La Corona Oil Company, subsidiary to the Dutch Shell interests.

The Magnolia Petroleum Company operates the company's holdings in the Panuco district and ships the oil to its Texas refinery. The Penn-Mex Fuel Company has under lease and in fee about 500,000 acres of land, most of which is in the Alamo field and south of the Tuxpam River, or in the Panuco district.

Most of these companies have recently increased their holdings, and a number of new companies have entered Mexico with smaller holdings.

Import Figures Listed

As has been said, some oil companies in the United States exported crude oil to Mexico until around 1910, and some oil probably came from a few other countries. Figures on the amount of petroleum and its products sent into Mexico have been obtained for the year 1903 until 1909, when imports virtually ceased and exportation began. The table follows:

Imports of Oil into Mexico

Year	Gallons Crude	Gallons Lubricant	Gallons Paraffine
1903	9,858,154	.....	.....
1904	10,938,448	695,308	7,116,678
1905	14,036,517	697,382	8,955,116
1906	14,366,495	1,097,746	8,731,025
1907	19,992,434	1,255,991	11,755,550
1908	17,523,440	839,966	11,527,878
1909	27,554,581	1,165,272	14,334,311

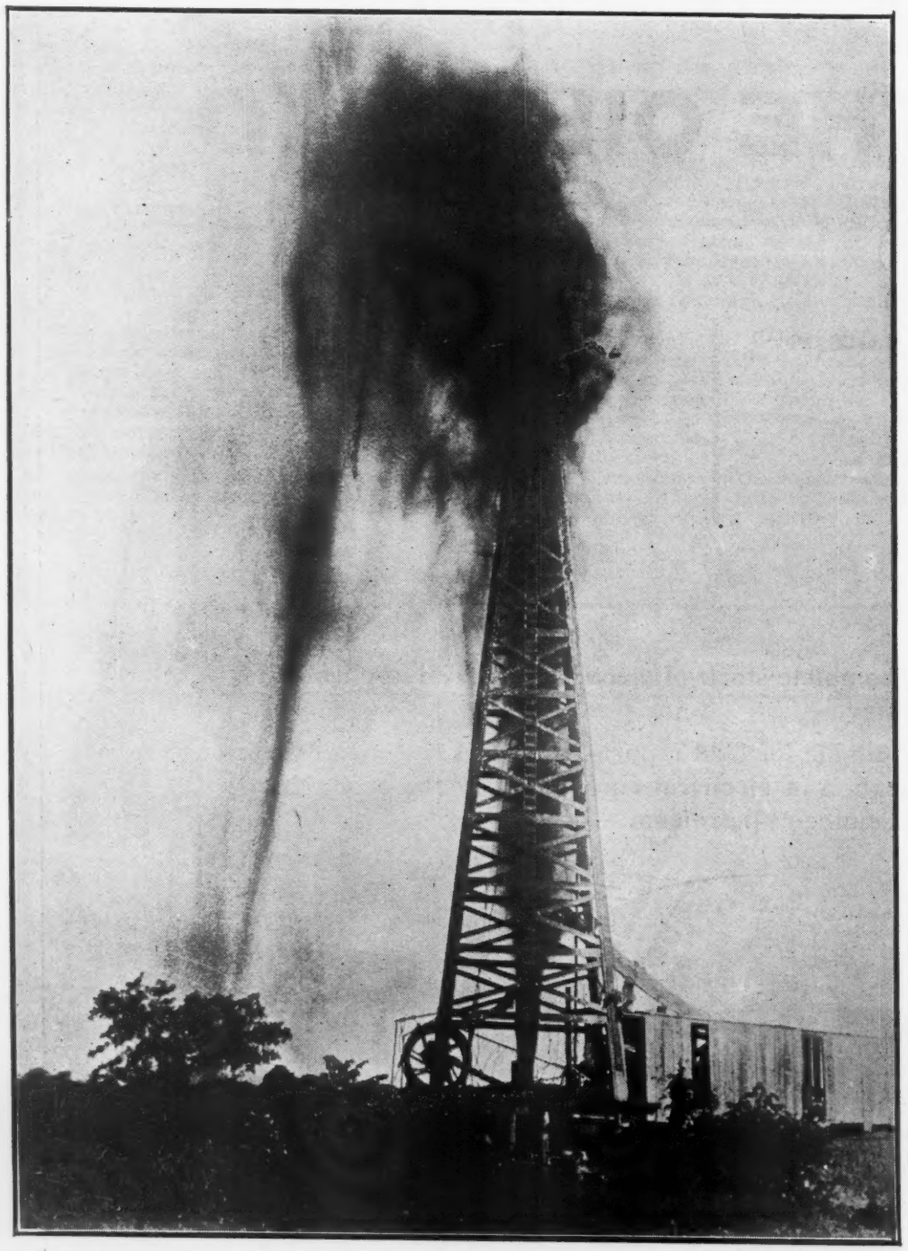
Excises Govern Imports

Mexican laws and duty had much to do with the first growth of production. During the nineteenth century, a law was put into effect setting import duties on refined products, including gasoline, at an exceedingly high rate. The tax on crude oil was considerably less. The Standard Oil Company, probably taking advantage of this, built a refinery in Mexico, sent crude there, and had it refined. Then came production within Mexico, and the Pearson interests of England built a refinery there, using Mexican crude. Since that time the imports of crude oil have virtually ceased, and exports have increased by tremendous strides.

Pipe Line Is Built

To satisfy the early demand for transportation facilities, the Mexican Eagle Oil Company in 1908 built an eight-inch pipe line to Tuxpam bar, and in 1911 the first Mexican crude oil was exported to the United States. During the years immediately following drilling operations continued and more wells were brought in, forcing the larger companies, such as the Mexican Eagle, The Texas Company of Mexico, the Standard Oil Company, the Huasteca Petroleum Company, the Freeport Mexican Fuel Oil Corporation (now a subsidiary of the Mexican Sinclair Petroleum Corporation) and, more recently, the East Coast Oil Company (subsidiary of the Southern Pacific Railway) and others to build tank steamers and barges for the exportation of the crude oil purchased. Up to the present time no Mexican crude has been exported in any way other than by water.

Since January, 1920, significant strides have been made in the transportation methods employed in Mexico. Numerous pipe lines have been built, sea lines—by which tankers may be loaded while at sea—have been successfully operated, additional tankers have been added, and transportation companies have been organized for the sole purpose of exporting Mexican crude. There are now more than 113 pipe lines in Mexico, others being completed at the present time, and several are well under way. The Freeport & Mexican Fuel Oil Corporation has three pipe lines in Mexico, with a total length of approximately 4750 meters and a daily capacity of nearly 53,334 barrels. This company shipped more than a million and a half barrels of oil from Mexico during the twelve months ending October 1, 1920. Five storage tanks belonging to this company are already in operation, with a capacity of more than 200,000 barrels of oil, and five additional tanks are now being constructed along the company's Vinas terminal on the Panuco



A REGULAR GUSHER. MEXICAN SINCLAIR PETROLEUM CORPORATION'S WELL ON LOT 114, CHINAMPA, STATE OF VERA CRUZ, MEXICO. DAILY PRODUCTION, 75,000 BARRELS.

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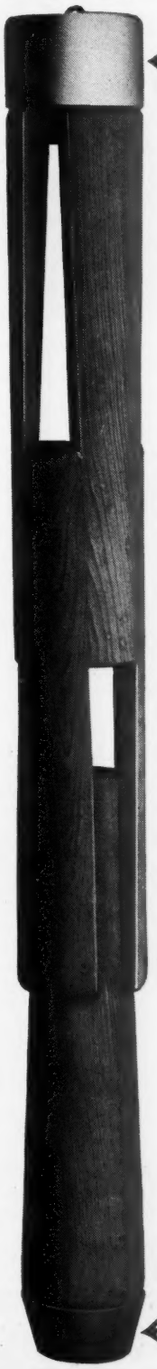

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FREEPORT MEXICAN FUEL OIL CORPORATION (SINCLAIR SUBSIDIARY)—GENERAL VIEW OF WHARF AND PLANT AT TAMPICO. HOMES FOR WORKERS MAY BE SEEN IN THE DISTANCE (SLIGHTLY TO THE LEFT IN PICTURE).

River. Two of these will have a capacity of 64,000 barrels each, and three of 55,000 barrels capacity each.

Large Storage Capacity

Cia. Metropolitana de Oleoductus has six pipe lines 40,570 meters long, with a daily capacity of 129,084 barrels. This company has eight storage tanks with a capacity of nearly 466,668 barrels. The Transcontinental Petroleum Company has 11 pipe lines, 20,743 meters long, and with a daily capacity of 244,462 barrels. It has 22 storage tanks with a capacity for 1,147,122 barrels.

The National Oil Company of Mexico has three pipe lines 10,985 meters long, with a daily capacity of 19,200 barrels, and one storage tank with a capacity of approximately 60,000 barrels. The New England Fuel Oil Company also has three pipe lines with a total length of 2276 meters, and a daily capacity for 93,334 barrels. This company has five tanks with a capacity for 318,160 barrels. The Cortez Oil Corporation has seven pipe lines, 78,603 meters in length, with a daily capacity of 323,136 barrels.

The Mexican Gulf Company has an eight-inch pipe line from its production in the southern fields to Tampico, and a ten-inch line from their Prieto terminal across the river from Tampico to the Tepetate oil fields. This line, which is more than 62 miles long, recently was completed, and with two pumping stations recently completed at Horconictos and Tepetate it has a daily capacity of 50,000 barrels. The total daily capacity of all the company's pipe lines is approximately 125,000 barrels, and the company has a daily production of more than 100,000 barrels of oil. This company has more than 80 storage tanks with a capacity for more than 825,000 barrels.

Lines of Mexican Eagle Company

At the present time the Mexican Eagle Oil Company has more pipe lines than any other company operating in Mexico. The lines, extending from the fields to the seaports, tank farms, refineries, etc., extend more than 180 miles, with a capacity for more than 6,000,000 barrels. The lines have a ship loading capacity of 100,000 barrels a day, and the two refineries, one at Minatitlan and one at Tampico, have a combined input capacity of nearly 30,000 barrels. The company has more than 375 tanks with an approximate capacity of 31,000,000 barrels.

The Oil Fields Company of Mexico has but one pipe line, which is the longest in Mexico, having a total length of 88,950 meters, with a daily capacity of more than 10,500 barrels. This company operates nine tanks, with a total capacity for approximately 187,686 barrels.

Up-to-date figures on the number, length and capacity of pipe lines, or the number and capacity of storage tanks are not available, the latest figures being compiled only through 1919, which of course does not include the many tanks and pipe lines built during 1920. Companies are constantly reporting that new pipe lines and storage tanks are now in use, and great numbers are under construction or being put into service at the present time.

Based on the latest available figures, there are 29 companies with 120 pipe lines in Mexico, with a length of more than a million and a half meters and a daily capacity of more than two and a half million barrels. There are about 40 companies operating more than 900 storage tanks, with a capacity of nearly 55,000,000 barrels. One notable bit of work now under way in Mexico is the refinery of the Cia. del Agwi at Tecomate, 85 miles south of Tampico, which will have a capacity of from 50,000 to 60,000 barrels daily.

Division Into Fields

For the sake of convenience the Mexican oil fields may be divided into five general districts: (1) The Southern fields, including Alamo, Potrero del Llano, Cerro Azul, Los Naranjos, Juan Casiana, Tepetate, and in fact all the pools south of Tampico with the exception of (2) the Isthmus of Tehauntepec, which stands alone as a separate district; (3) the Panuco field, (4) the Topila field not far southeast of the Panuco field, and (5) miscellaneous fields which have produced but little oil.

These prominent Mexican oil fields are located along the east coast of Mexico between the sixteenth and twenty-fifth parallels, and include the eastern portion of the states of Vera Cruz and Tamaulipas and a part of the Isthums of Tehauntepec. Of these, the most prolific oil producing area has proven to be the state of Vera Cruz.

The separate pools of petroleum occurring in the oil region of Mexico are known locally by different names. The proven districts farthest north consist of the Chijol pool, thence south: the Salinas, Ebano, Panuco, Topila, Tamboyoche, Dos Bocas, Tepetate, Casiano, Los Naranjos, Cerro Azul, Tanhuijo, Tierra Amarilla, Potrero del Llano, Alamo and Furbero pools, and further south the Isthmus of Tehauntepec and the San Cristobal pools.

Types of Topography

There are three different and pronounced types of topography found in the oil producing states of Mexico: (1) the rugged mountains of the Sierra uplift, (2) the low, marshy land immediately adjacent to the coast, and (3) what may be termed the interlaying area between the moutnains and the lowlands, whose surface rocks are soft and porous sands. The area characterized by the last two forms of topography is known generally as the Gulf Coastal plain and is a southern extension of similar plains in South Texas.

This plain, having a width of more than 200 miles on the north on the Rio Grande, narrows on the south until in southern Vera Cruz it merges with the coast line. The general range of the area is to the east, being controlled by three main rivers, the Panuco, the Tuxpam and the Papaloapam. The River Panuco rises in the mountains of Monte Alto in the state of Mexico, and flows northeast into the states of Hidalgo, Querrataro and San Luis Potosi and thence across the northern part of Vera Cruz to its mouth on the Gulf of Mexico at Tampico.

The River Tuxpam rises in the mountains of Hidalgo, flows northeast across the state of Vera Cruz, and empties into the Gulf at Tuxpam. Sand bars at its mouth prevent large boats from entering its waters. It is navigable only by small river craft.

The River Papaloapam rises in the state of Oaxaca, flowing north and east across southern Vera Cruz, and empties into the Bay of Campeche just south of Alverado.

The center of the most proliferous zone of Mexico is located in the states of Vera Cruz and Tamaulipas between the Sierra Madre Mountains on the west and the Gulf of Mexico on the east. This area comprises the north central part of the Gulf Coastal plains and is pronounced to be formed mostly of cretaceous and tertiary marine sediments, with a thin, irregular coating of quartenary near the coast

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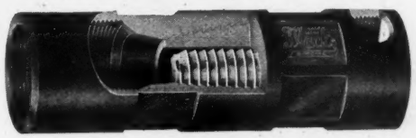

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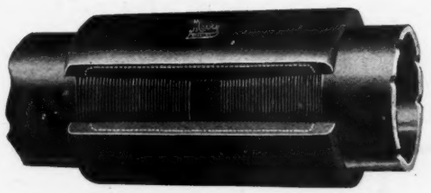

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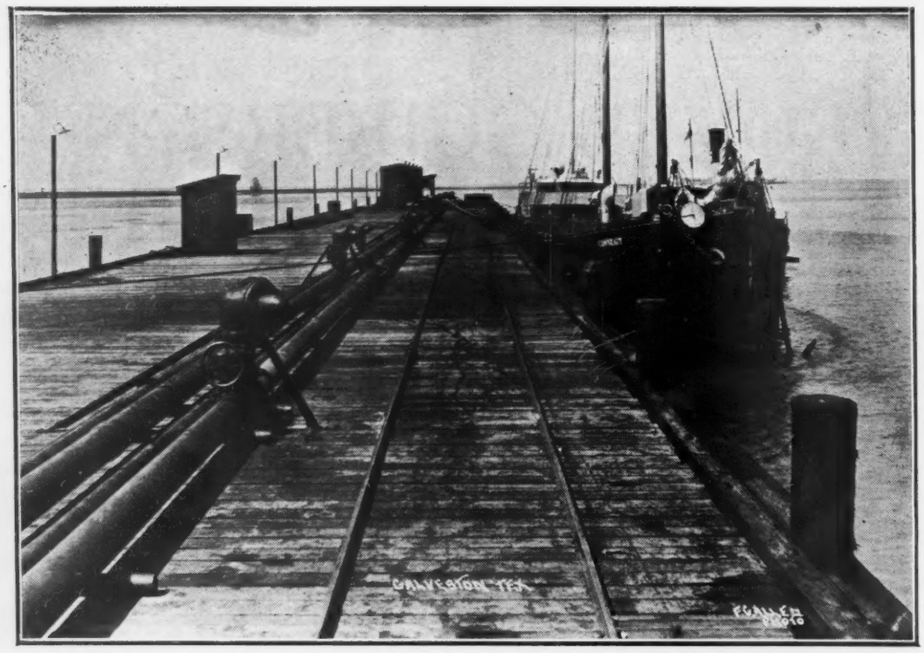


EXPORTS OF OIL FROM MEXICO ARE MOUNTING EACH MONTH. ABOVE SHOWS AN OIL TANKER DISCHARGING AT GULP PRODUCTION COMPANY'S DOCK AT GALVESTON.

and with frequent intrusions of igneous rock in the form of dykes, plugs and sills.

Rocks of Various Ages

The Gulf Coastal plain extends from southern Tamaulipas to Campeche, with indications of oil deposited in rocks of various ages. Among the deposits are those of Ebano, 30 miles west of Tampico on lands of the Mexican Petroleum Company, where large quantities of heavy asphalt oil have been obtained for many years from a stratum of probably Jurassic age pierced by volcanic necks. East of this are the cretaceous rocks with oil; and in northern Vera Cruz, between Tuxpam and Vera Cruz, there is a surface formation of blue clay marl about 2000 feet thick overlying porous limestone saturated with oil, gas and water. Intrusive igneous rocks in shape of the necks and dykes named above save pierced the overlying strata, forming dams and pools for oil to accumulate.

In the Isthmus of Tehauntepec, in the basins of the San Juan, Coatzacoalcos and Tancochapa Rivers, there are surface deposits of blue clay marl from 200 to 2000 feet thick overlying heavy porous limestone, but there are no dykes as in the northern districts. Domes, similar to those in Texas, are found in this southern district, with a presence of gypsum and rock salt below the oil lime.

Classification of Oils

The oil in the northern fields as at Ebano is heavy and from 10 to 14 degrees Beaume. In the southern fields as at San Cristobal it becomes light and runs from 26 to 30 degrees Beaume, and in the Frontera district the oil ranges from 32 to 43 degrees Beaume. From the heavy oils found in the north a little more than one per cent gas is obtained, and a little more than 10 per cent illuminating oil. In the southern district as at Minatitlan about 11 per cent gas and from 25 to 27 per cent illuminating oil, considerable gas oil and lubricating oil is obtained. The oil from the Frontera field resembles that of the Pennsylvania field, running 4 to 5 per cent sulphur in the Ebano field and about 3 per cent sulphur in the San Cristobal field.

Of the total investments in the oil industry in Mexico 97 per cent is held by foreigners, according to a report prepared by the Latin American division of the Bureau of Foreign and Domestic Commerce. This compares with 4 per cent of the oil investments of the United States which is held by foreign capital.

In 1918, the report says, there were 27 companies in Mexico which produced oil in commercial quantities and of these 17 were owned by Americans, five by Spanish-Mexican capital, three by Dutch, and two by British interests. In 1918 73 per cent of the oil produced was by the American companies. The British concerns came second with 21 per cent. In 1919, the amount of production credited to British interests was materially increased.

The Mexican Review, official organ of the government, gives the number of wells in Mexico as being 1103, itemized as follows:

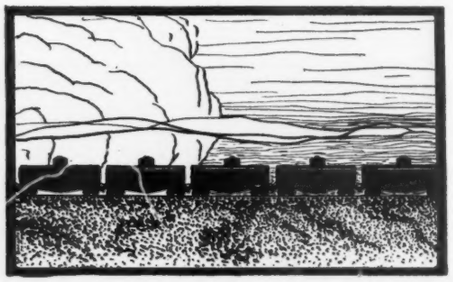
Number located	147
Number drilling	123
Number producing	305
Not paying	35
Producing water	65
Unproductive	428
Total	1103

It is explained that the wells in full production have demonstrated their ability to yield more than the thousands of wells now in existence, for instance, in the United States.

The producing wells, according to one review, are divided among the larger companies as follows:

Aguila Company (Lord Cowdray)	55
Mexican Petroleum Company	34
Corona Company	10
Union Petroleum Company (Hispano-Americana)	17
Texas Company of Mexico	14
Mexican Gulf Oil Company	8
Chicholes Oil Company (Ltd.)	7
Mexican Combustible Company	9
Penn.-Mex Fuel Oil Company	7
Freeport & Mexican Fuel Oil Company	7
Oil Fields of Mexico	12
Transcontinental Petroleum Company	14
Atlantic Gulf Oil Corporation	4

Numerous wildcat tests are going down in Mexico in an attempt to find new pools between and connecting the old ones, as well as in entirely new districts west of the now producing territory. The opening up of new pools and fields in these places will mean much to the oil industry of the world.



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Determining Gasoline Content in Natural Gas

A Consideration of Factors in Tests by Absorption Method

By D. B. Dow

Assistant Petroleum Chemist, Bureau of Mines

IN the natural-gas gasoline industry, the methods used in determining the amount of gasoline in natural gas are many and varied; they include the specific gravity test, laboratory tests involving absorption, change in volume of the gas or in the absorption medium, absorption in charcoal with subsequent distillation, compression of the gas which results in the condensation of the gasoline, and the absorption of the gasoline vapors in an absorption oil, from which the gasoline is distilled and measured. Each of these various tests has advantages and disadvantages. It is however, conceded in the industry that the tests in which the gasoline is obtained and measured as such, are the more reliable.

This paper deals with certain factors which should be considered in making absorption tests using "mineral seal oil" as an absorbent; this method of testing is widely used not only in the field, but in control work in absorption gasoline plants where the gasoline content of the intake and discharge gas is determined daily. In control work it is frequently found that the plant produces more gasoline than the tests show, which gives the plant the appearance of making more gasoline than is actually present in the gas treated, or in other words operating at more than one hundred per cent efficiency. Obviously then, the tests as made in these cases are in error, and in hope of correcting some of these variances, the following factors have been studied at the United States Bureau of Mines petroleum station at Bartlesville, Oklahoma.

Saturation of Absorbent Oil

Probably the most important factor in making an absorption test is the saturation obtained in the mineral seal oil. This should be watched closely, always keeping well within certain limits, dependent upon pressure and temperature. When an absorber of the Bureau of Mines type (for description see Dykema, W. P., and Neal, R. O., Application of the absorption process to recover gasoline from the residual gases of compressing plants, Tech. Paper—232, Bureau of Mines, 1919) is used where several compartments are available the excessive saturation of the oil in the first compartment is of small importance, provided, the saturation of the oil in the last compartment is low, but if the saturation in the last compartment is high the test should be discarded, for this is a marked indication that some of the gasoline has not been absorbed or that the gas has failed to be washed clean. Primarily for this reason, it is best to make separate distillations on the oil from each compartment. By this procedure it will always be evident whether or not the saturation in the last compartment runs high. On this phase of testing it is to be noted that unless the test is made with care by allowing pressure to build up slowly in the absorber, the operator will frequently find that the oil has blown from one compartment to the next. This often results in an insufficient amount of oil for good absorption in the first two chambers and gives a small amount of oil in the fourth compartment which was empty originally, possibly leaving the third compartment with about the right charge. Distillation of the contents of each compartment will show that the saturation of the first two chambers is low, whereas that of the third is high. With this indication the probability is that the test is not correct. However, if in this case the oil is all drawn into one container and a composite sample is distilled, there will be nothing to indicate the high saturation in the oil of the third compartment. (Note.—The above is an example of what might take place. It is equally possible to have oil blown through to the meter, resulting in very little absorption taking place in any compartment.)

The saturation of the oil should always be as high as possible in the first compartment, with a low saturation in the third or fourth, if four are used, which will give decreasing saturations in the intermediate chambers. This is recommended as it allows a maximum quantity of gas to be passed and also reduces the error in distillation.

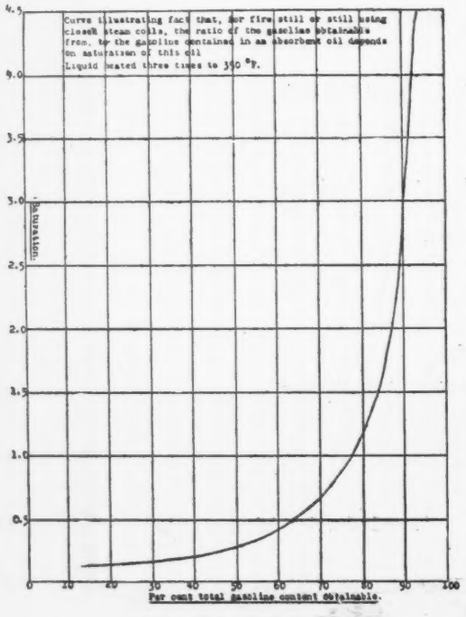

Curve illustrating fact that, for fire still or still using closed steam coils, the ratio of the gasoline obtainable free, to the gasoline contained in an absorbent oil depends on saturation of this oil
Liquid heated three times to 350 °F.
Saturation
Per cent total gasoline content obtainable.

Fig. 1—Fire Distillation

Loss In Distillation

J. D. Creveling (Unpublished Report, Creveling, J. D., Cities Service Co., New York, N. Y.) who first brought the Bureau's attention to the variations in the inaccuracies of distillation on mineral seal oil of different saturations, found that with the increase in saturation of the oil the percentage of gasoline obtained was correspondingly increased.

This was worked out by Mr. Creveling, in two series of experiments, by adding different quantities of a high gravity casing-head gasoline to mineral seal oil and then making a distillation on this mixture, raising the temperature to 350 degrees Fahrenheit, three times (the over point of the mineral seal oil being 470 degrees Fahrenheit.) In every case the amount of gasoline recovered was less than the amount added, but with higher saturations the percentage recovery increased to 93 per cent in oil of a 4.5 per cent saturation whereas oil of 0.5 per cent saturation gave only 65 per cent recovery. (Fig. 1.)

Upon studying Mr. Creveling's curve, it will be noticed that the loss in actual cubic centimeters of gasoline is quite constant, only varying a few tenths, and while this loss only amounts to 7 per cent with a saturation of 4.5 per cent, it represents a loss of 35 per cent when the saturation is as low as 0.5 per cent. Believing that the possibility of this loss is due to uncondensed vapors which escape in the distillation and to gasoline which never reaches the receiver due to adhesion to the surface of the condenser, the following experiments were undertaken by the writer.

Mineral seal oil having an over point of 470 degrees Fahrenheit was made up to different saturations with gasoline taken from the high-stage compressor of a casing-head gasoline plant. These mixtures were distilled with the condenser (A. S. T. M. Standard Condenser used) delivering the gasoline through a tight stopper into a small cylinder surrounded with ice; a second tube, through the same stopper led the uncondensed vapors to a Geisler potash bulb filled with mineral seal oil. The bulb was weighed before and after the distillation and the increase in weight was calculated to cubic centimeters on the basis of one gram equalling 1.5 c. c. of gasoline. The accompanying table and the curve (Fig. 2) shows results obtained.

It will be noted that the loss in uncondensed vapor in this particular mixture varies between 0.6 c. c. and 1.0 c. c., whereas other losses probably due to wetting the condenser wall vary from 0.37 c. c. to 0.85 c. c

These losses in cubic centimeters seem to be relatively constant and not necessarily dependent upon the saturation However, as pointed out previously, when the loss is stated in percentage it is dependent upon the saturation. The loss will differ to some extent with different gases, as shown by the variance of this curve from the one developed by Mr. Creveling, and naturally is to be expected because different gases will have gasoline of wholly different characteristics as regards low or high boiling point fractions and gravity. This represents an error in gas testing which is not generally considered, and while small, should be taken into account.

Rate of Distillation

In the speed of distillation of a mixture of gasoline and mineral seal oil, there is a wide

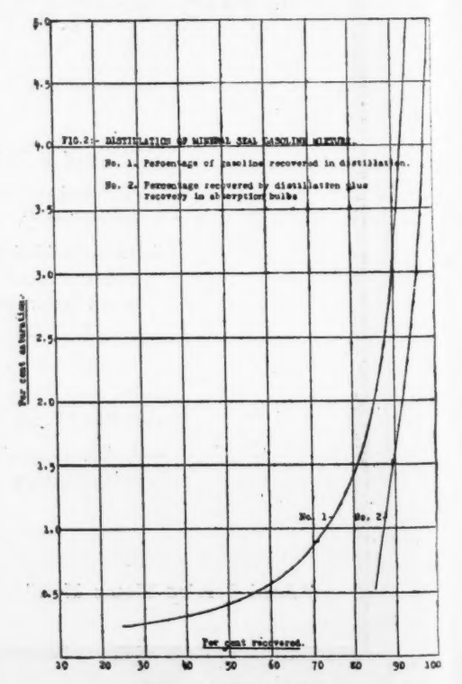
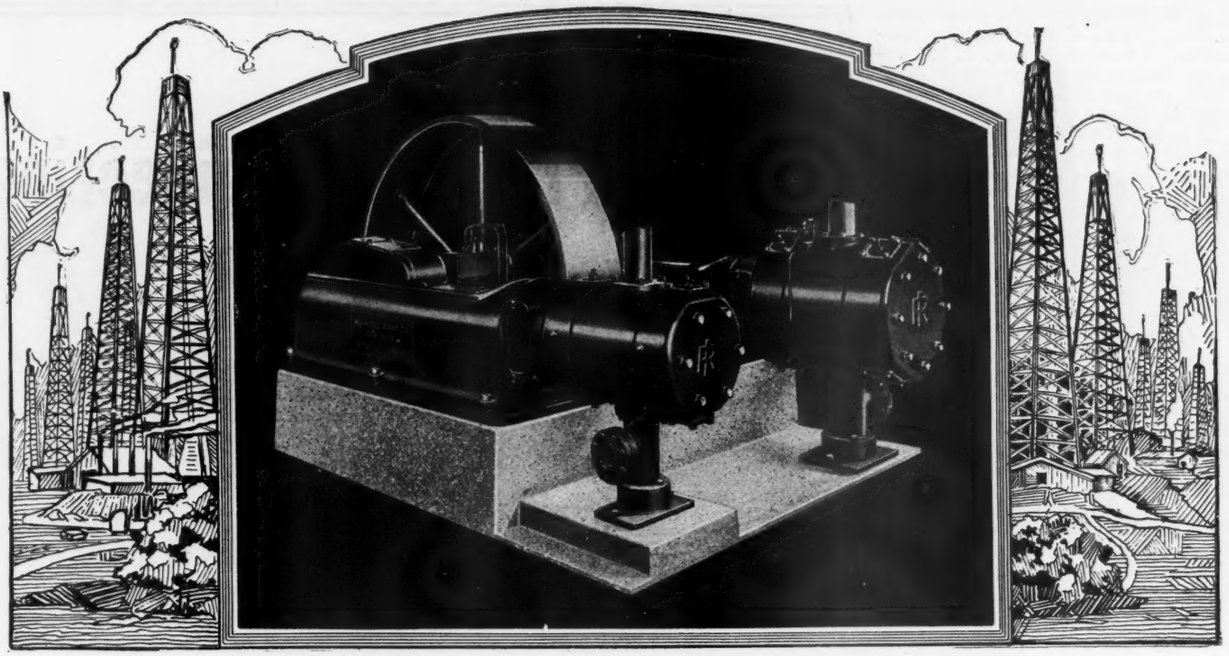


FIG.2:- DISTILLATION OF MINERAL SEAL GASOLINE MIXTURE.
No. 1. Percentage of gasoline recovered in distillation.
No. 2. Percentage recovered by distillation plus recovery in absorption bulbs
Per cent absorbed.
No. 1
No. 2
Per cent recovered.

Fig. 2—See Explanation



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range of time in which the same results will be obtained. In a series of runs with the condenser temperature held at 32 deg. F, the receiver being packed in ice and the only varying factor being the size of flame, which was so regulated that the oil came to the temperature of 350 deg. F in periods ranging from 7 to 43 minutes, it was found that of the recoverable gasoline 100 per cent was condensed on runs ranging from 12 to 27 minutes, but when the speed was increased to less than 12 minutes the yield dropped rapidly and at 7 minutes only 79 per cent was obtained. Also on a distillation which lasted 43 minutes, the yield dropped to 91 per cent (Fig. 2). This maximum and minimum will also vary with different gases, but by regulating the distillation rate so as to keep well within these limits the chances of error are decreased.

In the case of too rapid distillation the vapors evidently pass so rapidly through the condenser that they do not become sufficiently cool to condense, while in the case of a very slow rise in temperature the light hydro-carbons with their high vapor pressures are more completely fractionated from the heavier ones of the gasoline present, and due to these high vapor pressures and the absence of the lower vapor pressure hydrocarbons, a greater loss in evaporation takes place.

Temperature of Condenser

In determining the temperature under which a condenser can be held for best results, distillations were made with the speed constant (14 min.) on the same oil of known gasoline content, the only varying factor being the temperature of water in the condenser box. Distillations were made with the variations of temperature in the condenser ranging from 32 deg. F to 110 deg. F by ten-degree intervals. The curve in figure 3 shows the results obtained. It will be noticed in figure 3 that from 32 deg. F up to 60 deg. F there is no loss in gasoline, but from 60 deg. F to 110 deg. F there is an increasing loss. Hence attention of those who depend upon water entirely for cooling conimum temperature, in that all of the gasoline flask, 350 deg. F is considered to be the maxdensers, is called to the fact that this cooling agent if used without ice or circulation will be a source of error. (Fig. 4.)

Mineral Seal "Ring"

In distilling gasoline from mineral seal oil, using a standard condenser with the bulb of the thermometer at the vapor outlet of the

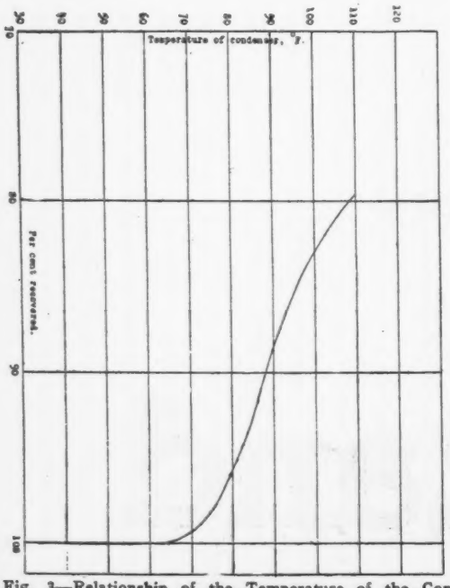

Fig. 3—Relationship of the Temperature of the Condenser to the Percentage of Gasoline Recovered

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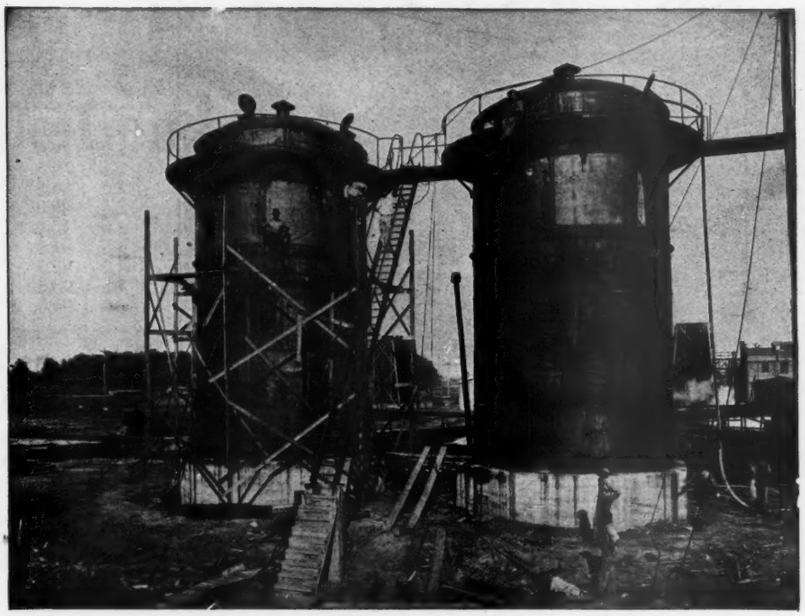

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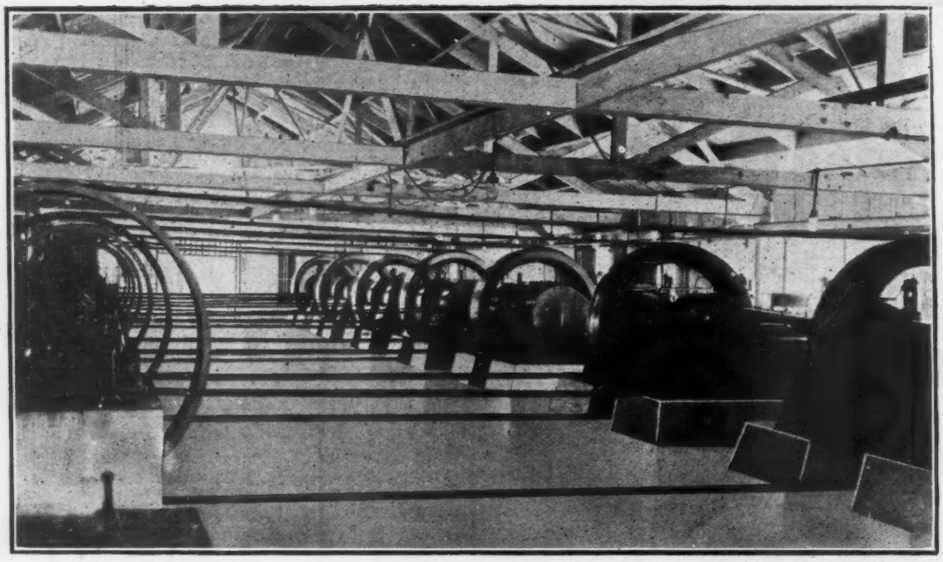

INTERIOR OF CASINGHEAD GASOLINE PLANT (COMPRESSION PLAN) IN OKLAHOMA, SHOWING VIEW OF ENGINES, COMPRESSORS AND BELTING SYSTEM

will be driven off when that temperature is reached. This would indicate that a "lag" in the thermometer would be expected at this point. Such is not the case, however, as the lag takes place nearer 300 deg. F than 350 deg. F, and the temperature does not increase noticeably until the mineral seal vapors reach the neck of the flask, at which time the thermometer rises rapidly to 470 deg. F (or to the initial boiling point of mineral seal oil). Because of this rapid rise of temperature, great care must be exercised to prevent mineral seal from passing into the condenser. If the neck of the flask is watched carefully as the end of the distillation draws near, a condensing ring of mineral seal will appear at the base of the neck, and will gradually rise. Operators will find that by watching for this condensing mineral seal oil and removing the burner when the ring is about half an inch below the vapor outlet tube, better control can be exercised than by reading the thermometer and cutting at 350 deg. F.

The data given below are representative, and as previously pointed out, different gases with gasoline vapor of different characteristics will give slightly varying results. These results will, however, not differ greatly, because the same principles apply in all cases. It is therefore hoped that the information contained herein will be of value to those who test gas by this method, by giving them ranges of operation which can be used with security.

Summary

1. A saturation of the absorbing oil should be as high as possible in the first compartment and as low as possible in the last.
2. Percentage of gasoline recovered by distillation is dependent upon saturation of oil.
3. The temperature should be raised to 350 deg. F in not less time than 12 minutes nor longer than 30 minutes.
4. Condensers should be held at a temperature less than 60 deg. F.
5. The distillation should be stopped by means of the mineral seal "ring" rather than by temperature readings.—U. S. Bureau of Mines, Reports of Investigations.

Data on Distillation Losses

Saturation	Percentage recovered by Distillation	Percentage recovered by Absorption in Bulbs	c. c. Recovered by Absorption Bulbs	Total percentage recovered	Percentage loss by Difference	c. c. lost
0.5	58.0	27.0	0.67	85.0	15.0	0.37
1.0	74.0	12.0	0.60	86.0	14.0	0.70
1.5	79.5	9.5	0.71	89.0	11.0	0.82
2.0	84.5	7.0	0.70	91.5	8.5	0.85
2.5	88.0	5.5	0.69	93.5	6.5	0.78
3.0	90.0	5.0	0.75	95.0	5.0	0.75
3.5	91.0	5.0	0.87	96.0	4.0	0.70
4.0	92.5	4.5	0.90	97.0	3.0	0.60
4.5	93.5	4.0	0.90	97.5	2.5	0.56
5.0	94.0	4.0	1.00	98.0	2.0	0.50

Texhoma Field Gas to Be Used by Wichita Plants

Wichita Falls, Texas, Oct. 20.—Industrial plants here are to be furnished gas this winter by the Texhoma Oil & Refining Company. This concern, a local company, has just purchased a six-inch pipe line from The Texas Company. The line connects the Texhoma field, south of Burkburnett, with the city.

Recently the Texhoma field come into prominence as a source of gas supply. The latest well is that drilled by the Johnson syndicates of Fort Worth on the Dodson lease owned by the Camp Oil & Gas Company. Its flow has been estimated as high as 35,000,000 cubic feet.

The new well is between the Tenana well and the Staley well, both gas producers with combined capacity of 10,000,000 cubic feet. The Jones Light Oil Company has two gas wells on the Rexford farm. Depths of the wells vary from 1360 feet to 1480 feet.

The Texhoma Oil & Refining Company will distribute gas to industrial plants only. In case of a surplus supply, the remainder will be offered to the North Texas Gas, the distributing concern for domestic gas here.

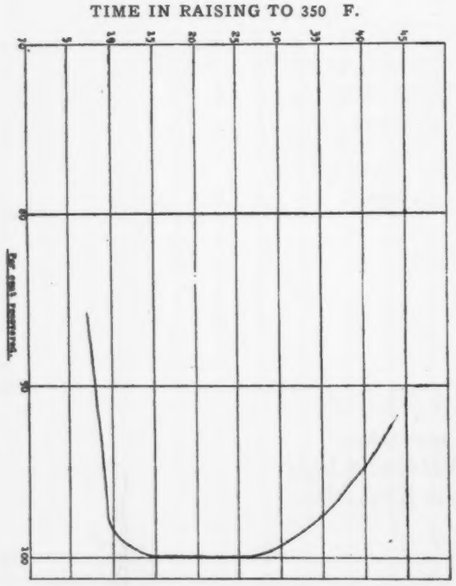

Fig. 4—Relationship of the Speed of Distillation to the Percentage of Gasoline Recovered

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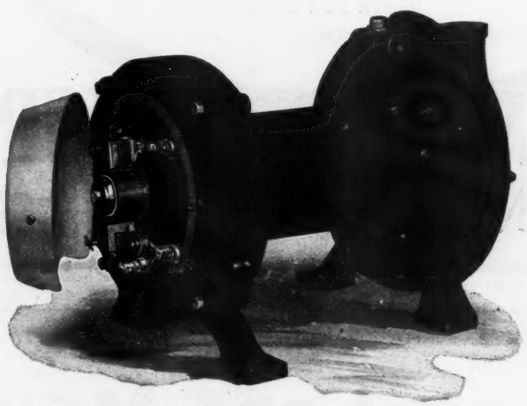

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Big Muddy's History Full of Thrills

In 1915 Second Field in Wyoming Produced First Oil

By C. F. Clay

Mr. Clay, the writer of this article, is president of the Merritt Corporation, which has been largely instrumental in bringing the Big Muddy field to the fore. Mr. Clay himself has been closely identified with the growth of Big Muddy, and is thoroughly conversant with every phase of the oil producing industry in that locality.

The OIL WEEKLY is grateful to "The Midwest Review," in which the article originally appeared.—The Editor.

WHAT is now the Big Muddy oil field is located principally in township 33, range 76 west of the sixth P. M., Converse County, Wyoming, 20 miles east of Casper and four miles west of Glenrock.

The possibilities of this field were brought to the attention of geologists as early as the year 1909, and some placer locations were made in 1910. Examinations by geologists at that time caused adverse reports to be made on account of the low price of oil, the estimated depth, and doubt as to the structure being closed on the southwest. All eyes were then focused upon the great Salt Creek field, approximately 39 miles due north of the Big Muddy, where large quantities of high-grade parafin base oil were discovered.

After these unfavorable reports little was thought of the chances of discovering oil in paying quantities in the Big Muddy field, and it was abandoned until the summer of 1914, at which time V. H. Barnett, then employed by the United States Geological Survey, made a personal examination of the Big Muddy structure, and in the fall of 1914 printed a bulletin embodying his report and opinion thereon, which in substance was that he considered the structure closed, and that the Wall Creek sand should be encountered at approximately 2500 feet, and that it should contain oil in commercial quantities, but that only the actual drilling of the structure could determine this fact.

Bulletin Arouses Interest

When this bulletin was published it caused considerable excitement, and leases upon patented lands and state lands in the vicinity were eagerly sought. Also, many oil placer locations were made upon government lands. Charles A. Mau, Henry A. Whitley, Julius Fried, Ralph Arnold—the eminent geologist, and associates—all from California, and T. S. Waltemeyer of Denver, succeeded in securing leases upon a large part of the patented and state lands. H. C. Young, Edward Wells, John Arnold and associates, had located a considerable area of the government lands upon which Charles A. Mau and associates had secured a lease.

Government locations had also been made by H. Leslie Parker and associates of Casper, and many others followed with locations in various portions of the field, more or lesse favorably located upon the structure. By springtime, 1915, all the well located lands were in the hands of, or in control of parties seeking to interest capital in the development of the field.

One deep test at what was estimated would cost $50,000, would determine the value of a large portion of the field. All were waiting for the "angel" who would come forward and expend this sum, but none up to that time were willing to expend such a large sum upon a purely speculative venture.

A. E. Humphreys and L. B. Brown of Denver, with Thomas A. Merritt and R. B. Whiteside of Duluth, associated with F. Julius Fohs, a geologist then located at Tulsa, Oklahoma, had organized the Merritt Oil & Gas Company, which deevloped the Boynton field in Oklahoma.

This same group of men had also organized the Humphreys Petroleum Company, which was engaged in developing the Billings field, also in Oklahoma.

Test Well Recommended

The possibilities of the Big Muddy field had been called to the attention of their geologist, F. Julius Fohs, through Ralph Arnold of Los Angeles, California. Mr. Fohs presented the matter to A. E. Humphreys and R. B. Whiteside, and these gentlemen, with some of their associates, made a trip to Wyoming, and Mr. Fohs made a detailed examination of the structure and a report thereon, in which he pronounced the structure closed and unqualifiedly recommended the drilling of a test well in the northeast quarter of section 8.

R. B. Whiteside and A. E. Humphreys then organized what was commonly called the "Humphreys-Whiteside Syndicate," and they proceeded to enter into negotiations for leases in the field, relocated a large number of claims, and commenced work in an active and energetic manner in the field on or about the 15th day of July, 1915.

The deep well located on section 8 reached the Shannon sand at a depth of 932 feet on or about the 25th day of August, 1915, and discovered commercial oil therein. This well showed a production of 15 barrels per day.

This discovery more than ever convinced Mr. Fohs that he was right in his judgment, and a number of Shannon wells were commenced in various parts of the field. Inasmuch as the deep well on section 8 was headed for the Wall Creek sand, no considerable production was obtained from this well, as the oil was cased off and drilling continued.

A number of Shannon wells were drilled throughout the field in the winter of 1915 and the summer of 1916. Some of these wells came in for a production amounting to as much as 200 barrels per day.

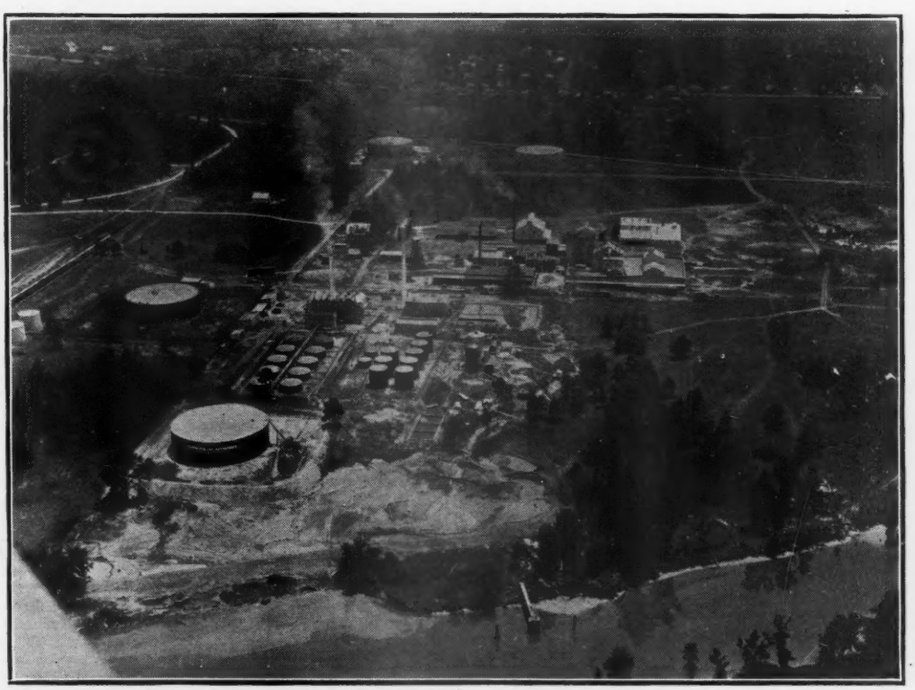
The deep well met with the usual difficulties encountered in the drilling of "wildcat" wells, and it took three attempts before the Wall Creek sand was finally reached. However, this well did not prove to be the first Wall Creek well drilled in the field.

Humphreys Hurries 'Em

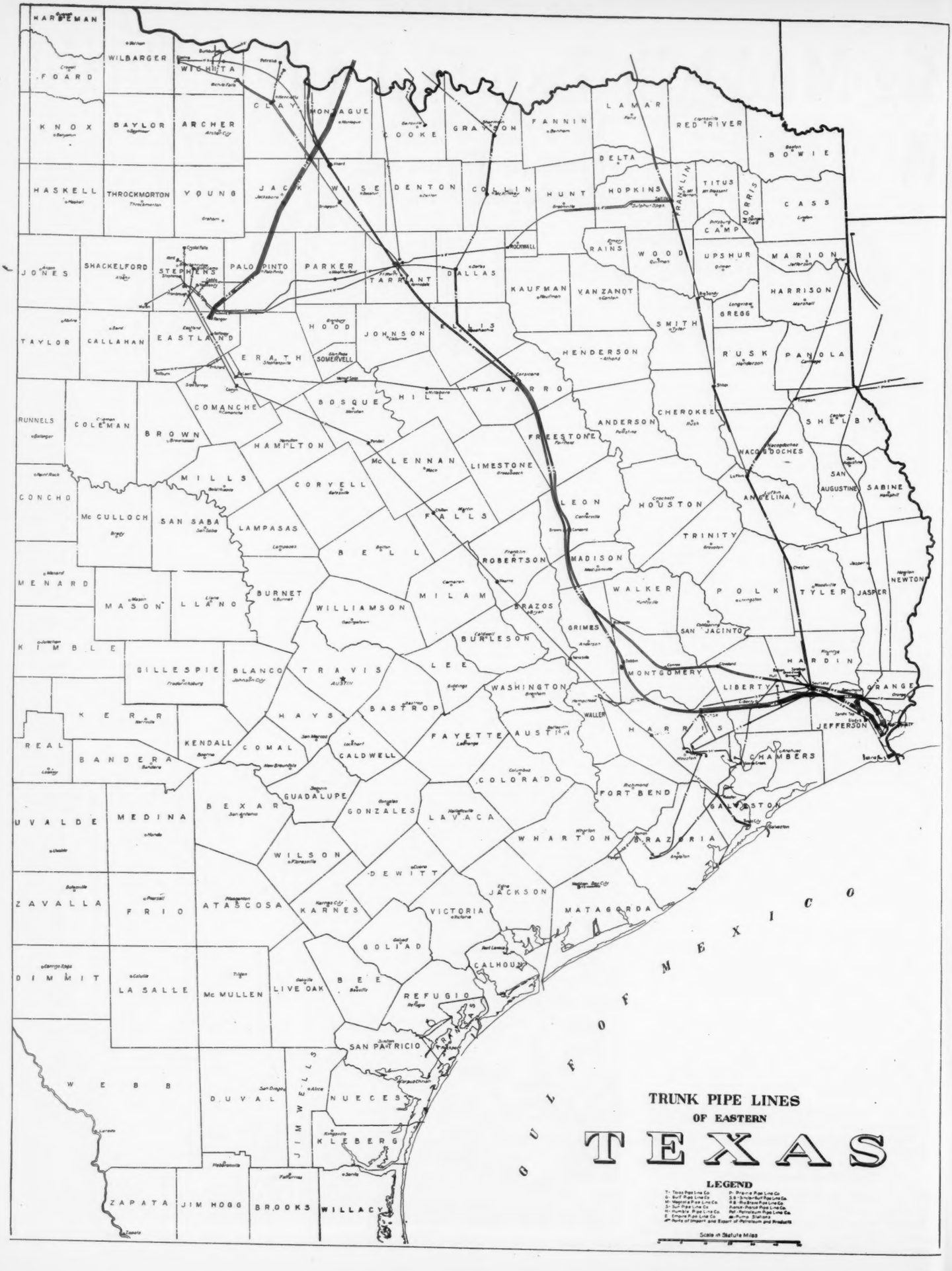
After drilling more than twelve months, the second hole was lost, and A. E. Humphreys, becoming impatient at the failure to reach the deep sand within a reasonable time, commenced to negotiate for additional acreage within the structure, and secured for the Merritt Oil & Gas Company a lease on section 10. This well was placed in charge of his son, A. E. Humphreys, Jr., and the Standard Exploration Company—a drilling organization officered by Snook & Swingle—were employed to drill the well. This well was commenced in the early part of May, 1916, and due to careful drilling met with remarkable success and reached the Wall Creek sand on the 11th day of November, 1916. This well came in for flush production in the neighborhood of 300 barrels.

The excitement had continued throughout the summer of 1916, and on September 5 of

(Continued on page 231.)



AIRPLANE VIEW OF DEEPWATER REFINERIES PLANT ON THE HOUSTON SHIP CHANNEL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BRAZOS
GRIMES
SAN JACINTO
KIMBLE
BURLESON
GILLESPIE
BLANCO
TRAVIS
LEE
MONTGOMERY
HARDIN
LIBERTY
ORANGE
AUSTIN
WASHINGTON
BASTROP
HAYS
WALLER
KERR
REAL
KENDALL
COMAL
FAYETTE
HARRIS
JEFFERSON
BANDERA
CALDWELL
CHAMBERS
COLORADO
FORT BEND
GUADALUPE
BEXAR
GONZALES
LAVACA
GALVESTON
UVALDE
MEDINA
WHARTON
BRAZORIA
WILSON
DEWITT
JACKSON
ZAVALLA
FRIO
ATASCOSA
KARNES
VICTORIA
MATAGORDA
GOLIAD
CALHOUN
DIMMIT
LA SALLE
McMULLEN
LIVE OAK
BEE
REFUGIO
SAN PATRICIO
WEBB
DUVAL
JIM WELLS
NUECES
KLEBERG
ZAPATA
JIM HOGG
BROOKS
WILLACY
GULF OF MEXICO
TRUNK PIPE LINES
OF EASTERN
TEXAS
LEGEND
Scale in Statute Miles

Pipe Lines in Two States Are Listed

Many Miles of Oil Lines in States of Oklahoma-Texas

Texas and Oklahoma have their full share of the 45,000 miles of pipe line with which the United States is credited. Seeking definite data, The OIL WEEKLY sent men to both Austin and Oklahoma City to obtain data. The results are shown in the accompanying figures.—Editor.

PIPE lines in Texas, according to maps in the office of the Texas Railroad Commission, Bureau of Oil and Gas, are as listed below. In many cases the length of lines were measured by scale and each must be taken as approximate distances. Also it is possible that the list is not complete.

American Petroleum Co., 6 in. line from Galena, Harris County, to Humble, 24 miles.

Arkansas City Pipe Lines, 3 and 4 in. line from loading rack in Cotton County, Oklahoma, into Wichita County, Texas, 2.8 miles of 3 in. and 4.1 miles of 4 in.

The Associated Oil Co. of Texas, 4 in. from J. G. Harding's land south of Burkburnett to Block 87, Red River Valley Land sub-division, 4.5 miles.

Barker & Donaldson (formerly Burk-Lawton Pipe Line Co.), 4 inch from southwest corner tract A-90 to Lawton, Okla., 1.9 miles (in Texas).

Border Gas Co. (gas line) from Jennings gas field to Laredo, 40.93 miles.

Brownwood Gas Co., 5⅝ in. gas pipe, from Waller County school survey, Brown County, to Brownwood, 11.13 miles.

Burkburnett Pipe Lines & Refining Co., 4 in. from Iowa Park to Northwest Extension, 13.5 miles.

Coleman Gas & Oil Co., 4 in. gas line from Manuel Martinez survey to Coleman via Santa Anna, 14.2 miles.

Constantin Refining Co., 4 and 3 in. lines in Burkburnett and Northwest Extension, 13.6 miles 4 in. and 2.2 miles of 3 in.

Consumers Gas & Fuel Co., 6 and 8 in. gas line from Millstrap field to Mineral Wells, 8.6 miles. Also, 8, 12 and 16 in. gas line from field one-half mile west T. & P. Ry. to Fort Worth, 18 miles.

A. H. Craver & Co., 2 in. distributing line from refinery in block 85 to Wichita Falls and Northwestern Ry., 4.4 miles.

De Leon Gas Co. (size of pipe not indicated), De Leon to Victor, 6.6 miles. Also Desdemont to Dublin (through Jakehamon) 18.21 miles.

Empire Pipe Line Co., 6 in. from connection with Texas line to Waurika to point Red River, 6.2 miles. Also 8 in. 4 miles. Also 2 and 4 in. gathering lines into Burkburnett, several miles.

Gilliland Oil Co., network of 3, 4 and 6 in. lines (lengths not available because scale not shown on map) throughout Wichita and adjoining counties.

O. V. Goldrick, 2 inch gas line from Newton gas well in Brown County to Burkett, Texas, nearly 3 miles. Also 2 in. gas line from Phillips Petroleum Co. and Pennant Oil & Gas Co.'s No. 1 Gasser in Brown County to Cross Plains, nearly 10 miles.

Gulf Pipe Line Company as follows:

Six in. Potter Station, Marion County to Timpson Station, Rusk County, 62 miles. 3 in. Mansfield Station to Sabine River (26 miles), 6 in. thence to Timpson. 6 in. Timpson south, 14 miles and then two 6 in. lines to Lufkin Station, 22 miles. 8 in. Powderly Station (Lamar County) to Sour Lake, 262 miles, thence to Port Arthur, 32 miles. Note.—8 in. loop from point in Angelina County 60 miles to Saratoga. Also looped Lucas to Olean, 11 miles. 6 in. loop Sour Lake to Lucas, 24 miles. 4 in. Electra to Burkburnett, 18 miles. 6 in. Burkburnett to Fort Worth, 114 miles. 6 in. Breckenridge to Ranger, 20 miles. 4 in. Desdemona to Ranger, 18 miles. 8 in. Ranger to Weatherford-Fort Worth, 80 miles. 8 in. Fort Worth to Greenville, 80 miles. 6 in. loop Greenville to Satillo, 38 miles. 6 in. Sattillo to point 70 in Angelina County, 146 miles. 6 in. Batson to Sour Lake to Hull to Crosby to Humble to Goose Creek, 95 miles. 8 in. Sour Lake to Lucas, 25 miles. 8 in. Houston to Lynchburg, 16 miles. 6 in. loop Lucas to Olean, 12 miles.

Interocean Oil & Refining Co., 3 and 4 in. lines in Wichita County, about 3 miles.

Invader Oil & Gas Co., 3 in. line in Wichita County, about 3 miles.

K-M-A Refining Co., Mankins, to K-M-A field, refinery site, about 6 miles.

Livingston Refiners Corporation, 4 in. crude and fuel line and 4 inch gasoline lne from Block 97 Northwest Extension to loading rack south of Devol, Oklahoma, approximately 3 miles.

Lone Star Oil & Refining Co., 3 and 4 in. lines from Fort Worth and Denver Railway, to Block 88 Wichita County, 16 miles thence to block 97 (3 in. only) 1.5 miles. Also approximately 3 miles of 3 in. to General Oil Co.'s well in 821.

Lone Star Gas Co., gas lines as follows:

Six in. Denton to McKinney, 26 miles; 10 in. Gainesville to Denison 37.5 miles (also 3 mile branch of 10 in. to Sherman). Also 16 in. Fox Field, Carter County, to Dallas, 131 miles; 16 in. to Fort Worth, 25 miles. Keys Field (Cotton County) 12 in. to Petrolia, 31.89 miles, (branch to Wichita Falls) thence 16 in. through Bowie, Sunset, Alvord, Rhome to Fort Worth, 94 miles. 12 in. Strawn to Joshua, 63 miles; Joshua to Cleburne 7.8 miles; Cleburne to Hillsboro, 27.34 miles; Hillsboro to Waco, 30 miles. 10 in, Cleburne to Bardwell (Ellis County) 40 miles. 8 in. Bardwell to Corsicana, 14 miles; Bardwell to Ennis, 7 miles. 16 in. from Joshua to midpoint between Fort Worth and Dallas, 25 miles.

Magnolia Petroleum Co.'s lines as follows:

Eight in. Yale to Addington, 159.81 miles. 6 in. Beaver to Addington, 17.19 miles. 6 in. loop Healdton to Addington, 26.13 miles. 8 in. loop Addington to Fort Worth, 93.41 miles. 8 in. Electra to Fort Worth, 137.98 miles. 6 in. Breckenridge to Corsicana 173.31 miles. 8 in. loop Fort Worth to Neches, 298.47 miles. Three 8 in. lines Neches to Gladys, 4.69 miles.

Middle States Oil Corporation from Block 96 Wichita County to Devol, Okla., approximately 3 miles in Texas.

Charles F. Noble, 3 and 4 in. lines in Wichita County, total about 4 miles.

North American Oil & Refining Co., 3 and 4 in. lines from E. T. Mitchell survey in A 191 to Lillis Morgan tract, Burkburnett field, nearly 5 miles.

Panhandle Refining Company, 3 and 4 in line from station near Lucinda Meadows tract south to Georgia Station, to W. F. & N. W. Ry., thence to refinery near Wichita Falls, 12.4 miles. Also 4 in. from Burkburnett to refinery, 7.5 miles.

Paragon Oil Co., 4 in. line from Block 76 to International Oil Co.'s tracts (with various branches), approximately 5.5 miles.

Pierce Oil Corporation, 3 in. line in Stephens County, about 2 miles long. Also in Eastland County from Wiles station to Smith lease, 4 in. loop 12 miles long; also 1.4 miles 3 in. and 1.6 miles additional 4 in.

Prairie Oil & Gas Co., 6⅝ in. line from Red Station through Blocks 94, 95, 88, 87, and 86; also 3 in. line from 86 into Woodburn Oil Co.'s tract; also 3 in from Block 87 into 97, approximately 5 miles.

Prairie Pipe Line Co., 6, 8, and 12 in. lines between Tiffin, Texas, and Ringling, Okla., total of 391.01 miles as follows: 8 in. M. K. & T. Ry. to Henson, 13.20 miles. 6 in. loop and 8 in. loop Henson to Tiffin (average length 7 miles); 4 in. discharge Gorman to De Leon, 7.22 miles. 8 in. De Leon to Tiffin, 19.51 miles. 3 in. Gordon to Tiffin, 8.07 miles. One 8 and one 12 in. Tiffin to Hensley, 54.59 miles. 8 in. Rogers to pipe line point, 13.96 miles. 8 in. loop Tiffin to Hensley, 47.44 miles. Two 8 and one 12 in. Hensley to Bowie, 32.68 miles. 8 in. and 12 in. Bowie to middle of Red River, 32.55 miles. These lines continue for 15 miles each, terminating at Ringling. 8 in. Magnolia leased line, Magnolia Junction (3.17 miles south of Bowie) to Duncan, Okla., via Ringgold, 74 miles.

Ranger Refining Co., 4 in. from tank farm in Block 77 Wichita County to station 818 in W. F. George tract, approximately 4 miles.

Rio Bravo Oil Co., 8 in. Damon to Pledger, approximately 12 miles. Also 6, 8 and 12 in line from Saratoga to Sour Lake, about 13 miles.

Sammies Oil Corporation, 8 in. gas line from northwest corner Highland Park addition, Ranger to Barker Well, more than 3 miles and 8 and 4 in. on to Gates Well, 3750 feet.

Sun Co., Dallas (Shuler-Duncan-Rust) size not designated, pipe line in Eastland County from J. G. Rust tract through T. W. Duncan tract through Mrs. S. R. Shuler tract, 18.7 miles.

Sinclair Gulf Pipe Line Co., 23.7 miles 2, 3, 4 and 8 in gathering lines in Burkburnett field. Also 8 in. line from Ranger to Bowie, 93.86 miles and from Bowie to Red River, 32.3 miles. This line goes on to Healdton. Also 4 in. line from Hogg Island Terminal to Ashbel Smith (Goose Creek) lease (formerly owned by Humble), 1.6 miles.

Southern Oil Corporation, 4 in. line from Burkburnett station to Red River, nearly 3 miles. This line goes on to Devol. Also 3 inch Red River in block 85 to Fowler station in 82 to Burkburnett station, about 4 miles. Also 3 in. line, Duke of Dublin Co. tract in 74 to Fowler Station, nearly 1 mile. Also 2 in. into 86, 87, 97, etc., about 5 miles in length.

Steiner Oil Corporation, 3 and 4 in. lines in Northwest Extension. About 2 miles 3 in. and 7 miles 4 in. Also, 3 in. line from D. E. McCleskey tract to T. & P. Ry. rack, more than 1 mile. Also 6 in. of nearly 3 miles in length. Also 6 in. to E. F. Barnes tract, nearly 4 miles. Also 3 in. from Kate Hodge tract to Hawk tract, 1.6 miles.

Sunshine Pipe Line Co., K-M-A field to loading rack, south of Wichita Falls, 34,500 varas.

T. & B. Pipe Line Co., between 3 and 4 miles of 3 in. gathering lines in 86, 87, 83, 74, 75, 59, Northwest Extension to loading racks near Burkburnett.

Texas Pipe Line Company, as follows:

Main trunk line, 8 in. Bartlesville to Port Arthur, 601.69 miles. 6 in. Electra to West Dallas, 159.37 miles. 8 in. Vivian to Garrison, 208.72 miles. 6 in. Fort Worth to Armour Junction, 3.28 miles. 6 in. Vinton to Garrison, 32.62 miles. 8 in. Ranger to Fort Worth, 87.46 miles. 6 in. West Dallas to Millers Switch, 9.42 miles. 6 in. and 8 in. Crichton to Logansport, 37.05 miles. 6 in. loop, Humble to Port Arthur, 88.22 miles. 8 in. Garrison to Port Arthur, 14.32 miles. 8 in. Dallas to Humble, 229.03 miles. Loops, 244.46 miles. Branches, Texas, 175 miles; Oklahoma, 227 miles.

Texhoma Oil & Refining Co., 4 in, Wichita Falls to Burkburnett to Iowa Park, about 28 miles. Also 3 in. north of Iowa Park, more than 7 miles.

Turnbow Oil Corporation, 2 in. from Texas-Arkansas (W. F. George) via Interstate to junction in 86 including Delta Company branch, nearly 2 miles. Also 2 in. loop (1 miles) into Block 88 Wichita County joining 3 in. which runs 2.5 miles through Blocks 88, 89 and 90 to refinery.

Uniform Gasoline & Petroleum Co., 4 in. from refinery on W. F. & N. W. Ry. through Blocks 90, 95 and 96, nearly 2 miles. Also 2 in. from Block 96 into Block 98, nearly 1 mile.

United Producers Pipe Line Co., 6 in. line, Fort Worth to Ranger, 77.84 miles. Also from refinery at Hodges station, near Fort Worth to T. & P. Coal & Oil Co.'s properties, 77.84 miles. Also 4 in. from Mingus to Desdemona, 54.82 miles.

Victor Refinery, from southwest corner Block A-706 to O'Dell Oil & Gas Co.'s tract 1.7 miles.

Wagner Pipe Line (Gorman Home Refinery) Desdemona to Gorman, 8.4 miles 4 in. and nearly 2 miles of 2 in.

White Eagle Refining Company, 4 in through Northwest Extension, 3.5 miles.

Woodburn Oil Corporation, 6 and 4 in from Block 6, Greenwood, subdivision, Wichita County to Devol, Okla., 4.3 miles.

Humble Oil & Refining Co., 8 inch trunk line from Webster to Comyn (Comanche County, Texas), 267 miles. Also 482 more miles of 8 inch in the state as well as about 360 miles of gathering and field lines.

Oklahoma Petroleum Gasoline Company, 4 inch from lease in Block 98, Northwest Extension, to refinery in Oklahoma, about 2 miles. Four inch loop part of the way.

Western Oil Corporation, 4 inch line from receiving station in Wichita County, 5.4 miles into Block 87.

Nortex Refining Co., 3 inch line in Burkburnett field, about 6 miles from site in Samuel Anderson survey to point near W. F. & N. W. Railway.

Oklahoma Pipe Lines

The list of Oklahoma pipe lines was compiled by a representative of The OIL WEEKLY in the offices of the Corporation Commission in Oklahoma. Two companies are missing, Prairie Pipe Line Company and the Kay County Gas Company. These reports were not in.

As in the Texas list no capacities are given as there was no way of obtaining these data from the records. However, the reports show

(Continued on Page 240.)

Solving Water Difficulties in the Oil Fields

Methods of Caring For Intermediate Water Discussed

By A. W. Ambrose

This excerpt from Bureau of Mines Bulletin No. 195, "Underground Conditions in Oilfields", now in press is published by permission of the Director of the Bureau in order that it may be immediately available to the petroleum industry. This is the last of a series by Mr. Ambrose who is superintendent, Bureau of Mines, Petroleum Experiment Station, Bartlesville, Oklahoma.

It is announced that Bulletin 195 contains many diagramatic illustrations which have not been included in the different articles published.—The Editor.

WHEN intermediate water is present, the operator must exercise great care in protecting the upper oil sands while producing from the lower sands. In producing oil from the lower sands only, the upper oil sands should be protected either by the use of mud-laden fluid behind the pipe or by pumping a liberal amount of cement behind the water string. The producer should make certain that a sufficient quantity is pumped in so that the top of the cement is actually above the upper oil zone. This will prevent the middle water from entering the upper oil horizon.

The ideal method is to produce from the upper sands until exhausted, then deepen the wells and cement below the intermediate water and produce from the lower sands, but this would seldom be practicable. The operator, however, will usually want to produce from the lower sands—for example, the lower sand may be more prolific, the oil in the lower sand may contain a higher percentage of gasoline or furnish better lubricating stock, or the neighbors may be producing from the sand. In any event, every effort should be made to protect the upper sands from water in case it is desirable to produce from the lower zone.

Where a well is making a large amount of water from an intermediate sand and is producing from both the upper and lower oil zones, the well must either be plugged up from the bottom to above the middle water and production taken from the upper sand or else a string of casing cemented below the intermediate water. In plugging, it is best to use a large amount of cement to protect the lower sand and where a new string is cemented below the intermediate water, sufficient cement should be placed behind the pipe to assure proper protection of the upper oil zone.

Pumping Is Possible

In some fields, this intermediate water can be pumped out as fast as it comes into the hole, but the operator should know definitely that he is pumping out all of the water that reaches the well. A certain size pump will lift only so much fluid, and this should be considered. If the pump does not lift all the water, much of it may be working back into the oil sands. Furthermore, the water level may be low in the hole and as a result the pump may be skimming the oil off the water.

Goodrich[2] suggests the use of a liner with packers on the outside of the pipe at the top and bottom to shut off an intermediate water. The liner would be set opposite the water sand figuring the packers to confine the water to the sand. Where the water has any appreciable head, it is very doubtful if, in the majority of cases, satisfactory results will be accomplished by this method.

Correction of Edge Water

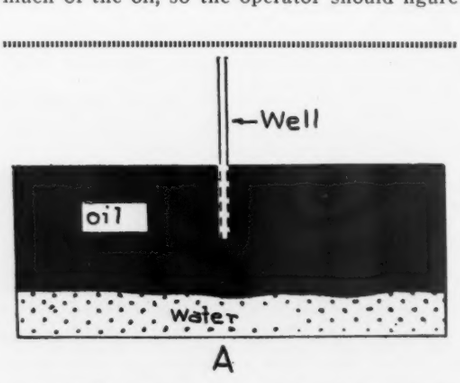
The proper handling of edge water presents a most difficult problem and is one of the most important fields of production engineering. Water occurring in a local lenticular sand should not be mistaken for edge water. Encroaching edge water ordinarily entraps a large amount of oil, and it is therefore of extreme importance that the operator obtain every barrel of oil possible by restraining the encroachment of this edge water. The following are suggested methods for restraining encroachment of edge water.

1. Use compressed air to hold the water back by forcing air into those wells nearest the edge water line, thus holding back the water, while allowing increased production in the wells up slope. This is a theoretical suggestion, which, to the writer's knowledge, has not been demonstrated in practice.

2. Keep the edge wells pumping in order to extract the water from the sand as rapidly as it encroached. A barrier could thus be created to protect the rest of the field. The desirability of this would depend upon certain considerations, many of them financial. In a large field the properties on the edge of the field often protect the interior wells.

3. Drill ahead of the approaching water and plug the well as soon as the water becomes troublesome. In explanation of this second suggestion, the following is given.

For the purpose of obtaining a maximum production, a careful study should be made of drilling costs and production in order to arrive at an economic cost balance that will determine the maximum number of wells that can be drilled in order that the production will yield the largest profit possible. In short, the encroaching edge water is certain to entrap much of the oil, so the operator should figure to get the greatest profit per barrel of production. He should follow the edge water encroachment carefully because it may indicate the advance is for a limited distance only.



A

ORIGINAL CONTACT OF OIL AND WATER

Protection of Different Sands

Where there are several sands, edge water may occur in the top, middle or bottom sand. If edge water occurs in the top sand and the water has advanced to the well, it is, of course, a matter of treating the upper sand as a top water sand, and then making a shut-off below it, as discussed in the last article.

Where there are several producing sands, and edge water follows up in an intermediate sand, it may be handled by plugging with cement from the bottom to a point above the water sand, after which the operator can produce from the top sand in that well. In doing this, great care should be taken that no water is allowed permanent access to the lower oil zones. Another way is to land a water string below the edge water sand and the well made to produce from the lower zone. It is important in such a case that the top oil sands be protected properly.

If edge water appears in the bottom sand of a well, it should be plugged off by cement and production taken from the sands above.

The above suggested corrections assume that the edge water has a large head of water. This is not always true. With a small volume, it may be cheaper to produce the water with the oil.

Water In the Base of Sand

As previously discussed, an operator should be very certain that the water and oil are not separated by a small break before deciding that the water occurs in the base of an oil sand. A distinction should be borne in mind between the small impervious break of a foot or less which is local in extent, and the one where the break is of uniform occurrence over the field, for in the latter the water would be termed bottom water. A local parting of less than one foot may separate the oil and water, and unless this parting has some particular feature noticeable in drilling, it will probably be passed by unnoticed. On the other hand, a sand may be impervious locally by cementation of calcite, silica, etc. This will serve as a barrier between the oil and water in one well, while in another where the cementation is not so tight, the water will occur in the base of the sand.

It is very difficult to place a thin cement plug of an exact thickness by ordinary dump bailer methods, but cement should be used and the well plugged in stages and tested. In each test the operator should see if the cement is hard, and plug only a few feet at a time.

The McDonald method of shutting off water in an oil well has been very successful in the Illinois field where water occurs in the base of the sand. This method has been described in a bulletin of the Illinois Geological Survey[2] and by Tough[3].

Some Cases Delay Only Possible

When the water and oil occur together, in a uniformly porous sand, and the water is under a large head, the application of the McDonald method or any other can at best only delay its approach, for eventually water will become master. No sand, however, is practically speaking uniformly porous.

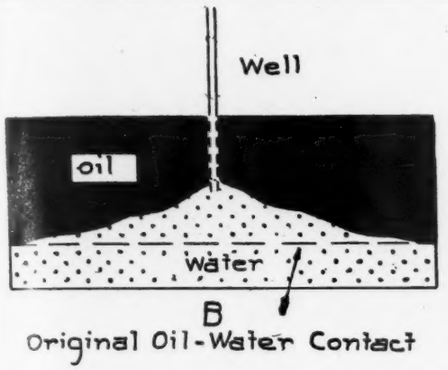
The accompanying are hypothetical sketches to show how water that occurs in the base of an oil sand may trap a large body of oil underground, if the sand is evenly porous.

A represents the original contact of oil and water while B shows the contact after much oil has been withdrawn. The water follows up the withdrawn oil, and the contact between the oil and water takes an irregular conical shape. Among other things, the shape of this contact will depend upon the uniformity of the sand porosity and the rate of withdrawal. The oil will, of course, work out more slowly from the tighter parts of the sand and thus a great deal of oil will be trapped below the oil-water line, as the water will go to the well through the more open parts of the sand. But with a

sand of fairly uniform porosity, the water will advance most rapidly from below and there will be a large amount of oil trapped underground, as more or less represented by figure C.

The hope of the operator for recovering as much oil as possible lies in the fact that all sands are not uniformly porous and that by the nature of their deposition, they contain local streaks of impervious partings of shale, clay or firmly cemented streaks.

It is readily seen how that impervious or semi-impervious streaks will retard or even prevent water encroaching. In C an impervious streak in the bottom of the well would allow the use of cement to shut off water coming into the well and oil could then be drawn from the upper part of the sand of that particular well.



CONTACT AFTER MUCH OIL HAS BEEN WITHDRAWN

These impervious streaks are more or less common in many oil producing strata and the operator should look for them in a drilling well. In a producing oil well, making water, plugging jobs should be tried even if the water and oil occur together, in the hopes that a parting will be found in the sand.

Water In Lenticular Sand

All sands are more or less lenticular. A small local lens of water may occur any place in the productive zone and should be handled as a top, bottom or middle water, depending on its location.

Protection of Upper Sands

The biggest production often lies in the lower oil sands, and as the operator desires big wells, he will often drill to these sands without regard to the upper small producing sands. In a field subdivided into small leases or ownerships, there is often an abundance of line well drilling, where the wells are put down with all possible speed to the big producing sand. Each operator tries to beat his neighbor to this sand so as to obtain the benefit of the flush production.

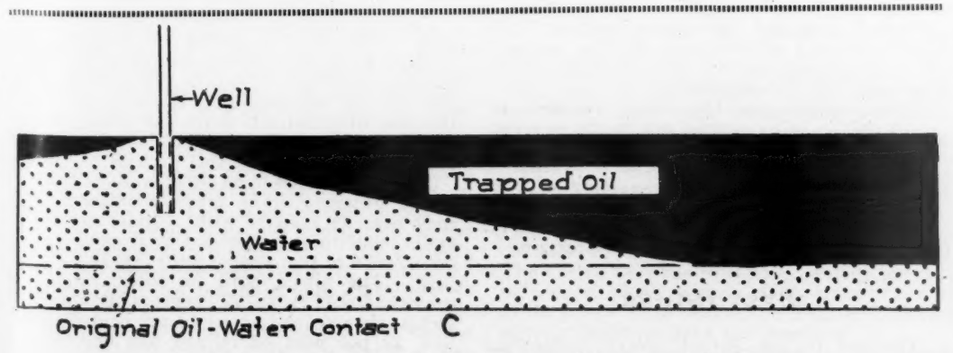
Many of the upper sands are good five to several hundred barrels of oil per day, and it is very important that they be properly protected against waste and water, until the time the operator desires to produce from them. This protection can be afforded at a reasonable cost and it is only good business to have these sands in reserve.

Where wells are drilled with rotary, only one string of casing may be used between the top of the producing oil sand and the surface. Obviously, unless the mud has sealed off the water sands and the oil and gas zones, the water can work up into other porous formations or to the surface between the wall of the hole and the outside of the casing.

These sands may be protected when a rotary is used by circulating heavy mud for several days before landing the water string. This mud should be left behind the water string after it is landed.

Where a well is drilled by cable tools, the oil and gas sands can be protected, either by the use of mud-laden fluid[4] or by the use of cement[5]. It may be advisable to cement a string of casing below each upper oil or gas sanr.

The upper sands are difficult to test once they are cased, off, and, if practicable, a drilling well should be stopped at the proper depth to make necessary tests.



OIL TRAPPED BY ADVANCEMENT OF WATER FROM BELOW

HISTORY OF BIG MUDDY IS FULL OF THRILLS

(Continued from page 227.)

that year the government made a withdrawal of practically the entire producing area in the field. Bidding for leases became spirited, and J. T. Hurst and associates are reputed to have paid in excess of $100,000 for the east half of section 16.

In November, 1916, A. E. Humphreys went to New York and met the representatives of the Ohio Oil Company, who secured from him some inside acreage. In December, 1916, the Merritt Oil Corporation was organized by officials of the Midwest Refining Company, in conjunction with the Humphreys' interests. This corporation affiliated with the Midwest Refining Company, which is now operating the field. The Merritt Corporation now owns and controls through various contracts and leases a majority of the producing area of the field.

The development during the next two years, under the supervision of the Midwest Refining Company, was rapid, and the Merritt Oil Corporation now has approximately 135 wells, of which 70 are to the first Wall Creek sand, and the remainder are Shannon and stray sand wells. Pipe lines, gas and water lines have been laid, machine and tool shops, boarding houses and comfortable living quarters for the men and their families have been erected, and operations are now in progress on a large scale.

Deeper Sands Being Tested

Two supposedly productive sands underly the first Wall Creek sand, and are known as the second and third Wall Creek sands. Two wells are now in progress to test these deeper sands, and if they are found to be productive will add tremendous potential value to the Midwest and Merritt holdings in the field.

The Ohio Oil Company has a similar camp to that of the Merritt Oil Corporation, in the east end of the field, and its machine shop is probably the largest in the state of Wyoming.

The Texas Company also has a substantial and well managed lease on the Mountain Home ranch near the center of the field.

V. H. Barnett, the first geologist to recommend the field, never lived to see his judgment justified. He died in the year 1916, prior to the completion of the first Wall Creek sand well. The oil companies interested in the field, in token of the value of his services, presented to his widow a handsome sum.

The credit for the discovery and development of the Big Muddy field must go to F. Julius Fohs, R. B. Whiteside, A. E. Humphreys, Thomas A. Merritt and their associates, coupled with the co-operation of H. Leslie Parker and the citizens of Casper and Glenrock. The subsequent magnificent development of the field should be credited to the Midwest Refining Company, the Merritt Oil Corporation, the Ohio Oil Company and the Texas Company.

The Big Muddy field is the second largest in the state of Wyoming, and with its present production and future prospects should hold its position as one of the foremost producers of high-grade oil in the state of Wyoming, if not in the United States.

Shell Company's Fleet Is Doubled Within Two Years

A tank fleet aggregating 544,669 tons compared with 263,746 tons in 1918 is now owned by the Shell Transport & Trading Company acording to its latest annual report. Sir Marcus Samuel, head of the Shell interests, said this would be increased beyond its present capacity "in view of the importance of owning a large fleet."

The company has bought several tankers from the British Government and will use them in the trade with Venezuela, where tracts are being developed by the Shell Company. These tankers will carry crude to the refinery at Curacao from the Maracaibo district.

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[1]Goodrich, H. B., Water encroachment and some methods for protecting the field: National Petroleum News, April 2, 1919, p. 68.

[2]Kay, F. H., Petroleum in Illinois in 1914-15: Illinois State Geological Survey, Bull. 33, 1916, pp. 87-88.

[3]Tough, F. B., Methods of shutting off water in oil and gas wells: Bull. 163, Bureau of Mines, 1918, pp. 82-85.

[4]Lewis, J. O., and McMurray, W. E., The use of mud-laden fluid in oil and gas wells: Bull. 134, Bureau of Mines, 1916.

[5]Tough, F. B., Methods of shutting off water in oil and gas wells: Bull, 163, Bureau of Mines, 1918.

REVIEW OF OIL WORK IN LATIN AMERICA

(Continued from page 210.)

cessionaires, as well as assignment to the government of 10 per cent of the gross output of petroleum. Last February a law was passed raising the government's share in the gross product of oil. This also added the provision that 20 per cent of the net profits from the working of petroleum deposits on fiscal lands should be paid into the treasury of the department in which the workings are located.

BRAZIL

That Brazil gives promise of yielding oil in commercial quantities is attested to by the fact that a bill ordering the investigation of the country's oil resources and their development either directly by the federal government or by private companies under strict supervision, has been introduced in the chamber of deputies. The measure sets forth that all proven oil-bearing lands may be expropriated by the government as a matter of public utility and developed with a view of supplying the country's own needs.

So far as could be learned by The OIL WEEKLY, little actual development is going on in Brazil. An abundance of oil shale has been discovered in this country, while that section lying near the Colombian border gives promise of fair oil returns.

CENTRAL AMERICA

Among the leading companies in the Central American field is the Sinclair Consolidated Oil Corporation. In the republic of Costa Rica the Sinclair company has a concession of approximately 9,000,000 acres of possible oil lands, with the right to select and retain approximately 1,000,000 acres. It also has a concession for the exploration of approximately 10,000,000 acres of prospective oil lands in the republic of Panama, with the right to select and retain about 1,200,000 acres.

The company's geological survey, according to a report issued in April, 1920, covering work in Costa Rica and Panama, has been finished, and drilling wells are now in operation on both of these concessions. The work of geological examination of these areas has extended over a period of years. Drilling operations have been actively carried on since early in 1920. Complete equipment and field organizations have been established by the Sinclair companies in both Costa Rica and Panama.

Provinces of Comarca de Limon, Guanacaste and Comarca de Punta Arenas, in Costa Rica, seem to be the favored spots of oil prospectors. Discovery of oil in commercial quantities in Costa Rica would mean the almost immediate construction of a pipe line to the Panama Canal, some 300 miles distant. This would give the production unlmited market opportunities.

Geological Report Cited

A number of large companies have had representatives in Costa Rica for the past five years, either making investigations or trying to obtain concessions. The Sinclair Gulf Company about two years ago succeeded in getting a concession which covers all the most promising Costa Rican petroleum resources.

As to the topography, Costa Rica consists of a general axial mountain range made up of granite and other crystalline and volcanic rocks, flanked on both the Atlantic and Pacific coasts by low-lying coastal plains and foothills. It is in the rocks which make up the lowlands along the coasts on both sides abutting against the mountainous interior, that petroleum occurs. In several cases the prospective fields lie alongside banana plantations maintained by the United Fruit Company. This is especially true between Bocas del Toro and Limon.

Petroleum is found at the surface in Talmanca valley (inland from the coast town of Bocas del Toro and several miles above Suretka, which lies at the end of a fifty-mile line of railway up the river from the port), seeping from joints and displacement zones in shales, with subordinate limestones and sandstones. Occurrences in Estrella valley and elsewhere are similar.

One geologist reports that most of the indications of petroleum in Costa Rica are associated with a series of shale beds, the aggregate thickness of which is probably several thousand feet. Almost every class of geologic structure is to be found at some point in the section from coast to mountain range.

Difficulties awaiting the oil prospector are many. Lack of labor, difficult transportation, and the problem of maintaining a close supervision in a region so far from commercial centers are listed as some of the handicaps.

Outlook Is Favorable

The geologist whose report we have quoted in this review summed up Costa Rica in the following words:

"A number of conditions which I believe to be essential to the accumulation of commercial quantities of petroleum can be detected in what we already know of Costa Rica. There are adequate thicknesses of rocks similar in character to those which yield petroleum elsewhere in the world; the presence of some quantity of petroleum is indicated by seepage; the beds are folded so as probably to have promoted accumulation processes; and the bedded rocks are so distributed as to make it possible to test their entire thicknesses at various places by drilling. Under these circumstances it will not be surprising if the exploitation already in progress in Costa Rica eventually results in the commercial production of petroleum there."

Another Large Concession

In 1917 the republic of Panama contracted with Lincoln G. Valentine for the development of a large tract of government land in an effort to find petroleum deposits. This contract was taken over early in 1920 by the Sinclair Consolidated Oil Company. This contract provided a general geological and practical inspection of certain parts of the republic, making of charts, maps, etc., laying of pipe line to transport produced petroleum, installation of refineries, etc. The contractor agreed to pay the government 5 per cent of the gross production. One of the articles provided for exemption from all exportation duties and free importation of all materials, machinery, etc. It also allows the contractor the right, as mentioned above, to select for intensive development 1,200,000 acres from the 10,000,000 comprising the concession.

Only recently there was a lot of private owned lands in Panama that could be leased at a reasonable price per hectare. One tract was about 45 miles southeast of the Sinclair test and consisted of approximately 10,000 acres. It was offered on a drilling contract. This tract belonged to the Franklin Baker Company of Philadelphia.

Little information has been available on work that is being carried out in the prospective oil fields of Honduras and Nicaragua. In 1917, an American, Lincoln G. Valentine sought the privilege of prospecting in Nicaragua. Whether or not any work which may be called development followed this, The OIL WEEKLY has not been able to ascertain.

WEST INDIES

Trinidad in the British West Indies has been yielding oil in commercial quantities since 1908. Up to and including 1918 when this island produced 2,082,068 barrels of crude, production for the eleven years totaled 7,432,391 barrels of oil.

Some regular gushers have been brought in by operators in Trinidad. Consul Andrew J. McConnico reported in 1915 that a well flowing 6000 barrels had been brought in. In 1917 on the Forest Reserve properties of the Trinidad Leaseholds, Ltd., a well which made 15,000 barrels of oil the first 28 hours was reported. This sanded up, was reopened and flowed at a decreased rate for more than a month when it sanded up again. This well came back some time later and made 20,000 barrels of oil in 20 hours.

The principal interests in Trinidad are British and companies include the United British Oilfields of Trinidad, Ltd., the Trinidad Lake Petroleum Co., Ltd., the Trinidad Central Oilfields, Ltd., and the Trinidad Leaseholds, Ltd.

The last-mentioned company has a topping plant with a daily capacity of 300 tons of crude oil at La Carriere. In 1918 it acquired the properties of the Trinidad Oil and Transport Company, this comprising about 100 acres in the Barrackpore district with a settled production of 3000 tons of oil a month and also a topping plant (capacity 130 tons crude daily) at Point-a-Pierre. The harbor at this point is suitable for the anchorage of ocean vessels while obtaining supplies of fuel.

Oil Used By Industries

Industries on the island, such as sugar factories, railway, electric power and light plants, boats, etc., have converted their equipment in order to avail themselves of the opportunity of using oil for fuel. Alexander S. Hay, American engineer, was instrumental in such an extensive introduction of oil-burning machinery.

The United States Geological Survey furnishes a list of companies "operating or organized to operate" in Cuba revised to June, 1918, as follows:

Antillian Oil Corporation, Bacuranao Oil Company, Bacuranao Petroleum Company, Bacuranao Oil & Gas Company, Bacuranao Mining & Petroleum Company, Benedum, Trees & Crawford, Candelaria Oil Company, Cardenas & Sabanilla, Chretland-New Haven Oil Company, Cia. Minera de Jaruco, Cienfuegos Petroleum Company, Cuban-American Petroleum Company, Cuban International Petroleum Company, Cuban Standard Petroleum Company, Eugenia Oil Company, Guanabacoa Oil Company, Pinar del Rio Mining Company, Republic Oil Company, San Francisco de Paula, Sinclair-Cuban Oil Corporation, Triunfo Oil Company, Union Oil Company of Cuba, United States Petroleum Company, Wells, Howard & Whitely.

Cuba chalked up as a producer of oil for the first time in 1917 when the figure was announced as 19,167 barrels. Although 1918 figures of the world's production of crude petroleum have been announced by the Geological Survey, no amount is credited Cuba.

Bacuranao, about 15 miles northeast of Havana is the most favorable oil district. The Cuban Petroleum Company (United States capital) completed a well in 1917 at a depth of 865 feet in this section. Production was at the rate of 25 barrels daily, oil testing 28 degrees Baume gravity. An 80-barrel well was brought in later on in this vicinity.

The oil obtained from these wells is thought to be obtained from crevices in serpentine rock near its contact with sedimentary strata under conditions somewhat analogous to the occurrence of petroleum in the Thrall (Texas) field. The oil is dark in color, ranges in gravity from 25 to 27 degrees Baume and yields when refined about 12 per cent of gasoline, 22 per cent of refined oils and 62 per cent of fuel oil.

LAKE OF OIL AT HONEY BAYOU, HARMON OIL FIELD, LOUISIANA. THIS FORMERLY WAS FILLED WITH WATER. Photo Allen, Houston

Louisiana Fields Have A Fair Year

Salt water in deep sand at Homer forces attention to shallow depths where good pay is found

By Grady Triplett

SHREVEPORT, LA., Oct. 15.—Peak production in the North Louiaisna fields was reached last April. At that time the daily average from the three fields of the district was 135,000 barrels. Since then there has been a gradual decline until the present figure is now around 80,000 barrels daily.

That big total of the peak production period and at the present lower level are the rise and fall of affairs in the Homer pool of Claiborne Parish. This prolific pool, small in area but rich in production from its two sands, was responsible for the sudden placing of North Louisiana in the front rank as an oil producing section. The old Caddo field and the newer Bull Bayou field are both steady but not spectacular in performance.

The first weeks of last January found the Homer pool producing from 20,000 to 25,000 barrels daily. Then the figures climbed to 40,000. For the final week in that month the total was 70,000. This low production of the early weeks was recorded despite the bringing in of numerous big wells, some of them being reported as good for more than 25,000 barrels daily.

For February the production at Homer reached 83,000 barrels daily. In March it was 85,000 barrels daily. Then came April, the peak month, when Homer production passed 90,000 barrels daily, once showing a daily average of 96,000 barrels for a week.

Decline Since April

Since then theer has been a decline. In May the daily average came down to 85,000 barrels. June saw the figure slump to around 80,000 barrels daily. By July it passed below 70,00 barrels. In September the 50,000 mark was not far distant.

During that span of rise and fall at Homer, the Bull Bayou field was doing a similar act but on a smaller scale. The first of the year found Bull Bayou good for 20,000 barrels daily. That rose to 23,000 daily in May, the high month for that field. Since then production has steadily fallen until the present daily total is around 14,000 barels daily.

In the Caddo district, it was a case of a comeback for the Pine Island field. This field, which once had a daily average of 45,000 barrels, was practicaly put out of the running by the shut-down of the winter of 1919 and 1920. The Caddo field has maintained a daily average of around 15,000 barrels daily since the first of the year. That production is divided, almost equally, between light and heavy oil.

Contrary to first indications in the Homer pool, the big production of the field did not come from the deep sand below 2000 feet. It was not until this stratum had developed salt water to a hurtful degree and attention turned to the 1100 foot sand that production began to climb, finally going to almost 100,000 barrels daily.

Salt Water in Homer

Salt water in the deep sand at Homer made its appearance early in January. At first it was stoutly denied in various circles. But well records showed that the lower sand was being materially damaged each day. Some wells, which had been completed as huge producers, made as much as 90 per cent water and basic sediment. The average, however, was far less than that.

But the salt water situation at Homer proved so bad that attention soon turned to the shallow level, and it is from that sand that the pool became for a time the leading one of the nation. Since early in the year completions in the deep sand have grown fewer each week, until now there is very little drilling to 2000 feet.

This did not hold true in all cases, notably the Gilliland Oil Company, one of the major producers of the field. This company bought at a high price in the heart of section 30 on the Jackson and Shaw tracts and did practi-

cally all its early drilling into the deeper pay. That it made the wells pay is evidenced from the fact that its production was for a long period above 15,000 barrels daily. In one deal the Gilliland Company sold 1,850,000 barrels of Homer Crude to the Standard Oil Company of Louisiana.

How the Gilliland Company is still coaxing more than 5000 barrels daily from its Homer leases is in some degree a mystery and one that other deep well owners would be glad to have solved.

Salt water at Homer was not unexpected to experienced operators. There was no gas from the deep sand but there was a tremendous pressure—a pressure sufficient to make some wells produce 35,000 barrels daily for a brief time. Experienced operators knew the pressure was hydrostatic.

Brought in Shallow Pool

Salt water is not a pleasant story at Homer. There are some financial tragedies wrapped in it. The best thing to be said of it is that it forced attention to the shallow sand and in so doing brought into development one of the richest oil formations in the history of American oil fields.

This shallow sand has never shown the tremendous wells credited to the deeper sand. But it has shown a staying quality that far surpasses the deeper sand and will compare favorably with any field in the world. For its area, the Homer pool is perhaps the richest of the fields recently developed.

Development in the shallow sand marched northward, where some slight extensions were recorded. This drilling brought in such leases as the Gulf Refining Company's West property, the Featherstone lease of the Gladys Belle Oil Company, and the Garrett tract of the F. C. Henderson interests.

The extreme thickness of the shallow sand at the north side of the field was established last April when the Gladys Belle Oil Company decided to experiment with its second well on the Featherstone tract. This well was first completed as a small producer. Then the tools were put back and the hole drilled another 150 feet, penetrating that much rich oil sand. The well was converted into a 5000 barrel flowing well and a substantial producer. Then other wells in the district were deepened and future wells were drilled to lower depths, with the result that the shallow sand in that part of the field became the rich section.

About this time the Gulf Refining Company took the lead in production at Homer—something it had held for a long spell in the other two fields of North Louisiana. The West lease of the Gulf Refining Company came in for immediate development. Its wells found the thick shallow sand and held up week after week. As late as August the Gulf Refining Company had at Homer 53 wells which were averaging 264 barrels daily. With such production as this, the Gulf held the lead at Homer until late in August, when the Standard went back to the top, a place it held for many months after the opening of the pool.

Inside Drilling Remains

Indications are now that the Homer pool will soon find its settled production. That it will for many years contribute materially to the nation's petroleum supply is indicated by the thick shallow stratum and the staying qualities of the wells already complete. Inside drilling remains to be done yet. But the field seems to be defined. It is one of the smallest of the major producing fields.

Discovery of oil in Claiborne Parish was made in section 30 by the Consolidated Progressive Oil Company, which completed a 2500 barrel well January 14, 1919, at 1411 feet. Three small wells were completed in May of that year in the shallow pay. Then came the deeper sand, and when the Standard Oil Company made a producer of No. 2 Oakes, it was estimated at 20,000 barrels. This was in August, 1919.

Small wells have been the rule in the Bull Bayou field. In a few instances wells better than 5000 barrels have been drilled in. But these have never held up for long. So the Bull Bayou field, which had its first completion in December, 1918, has never shown a high daily average of production. Last May it reached 23,000 barrels daily. It had been around 20,000 barrels for several months, and remained near that figure for a few more.

Now Bull Bayou production has fallen to below 15,000 barrels daily. The Bull Bayou field has the deepest pay stratum of the North Louisiana field, the oil bearing formation being found there at around 2750 to 2800 feet. This section has gas pressure and many gas wells have been completed around the field.

Late completions in the Bull Bayou field are small producers. Like the Homer pool, the producing area at Bull Bayou seems to have been defined. The field nestles in a series of bends of Red River. This, the north side of the field, has been the scene of some of the best wells in the field.

In Louisiana, they speak of Bull Bayou as "old reliable." It has never shown anything spectacular like Homer. But it still is contributing about 500,000 barrels of oil monthly and the production is near the settled figure.

Revival in Old Caddo

During the past year there has been a revival of drilling in the old Caddo field, particularly the Pine Island district. The Pine Island territory has had peculiar history. Back in the winter of 1918 and 1919 it was despised by the pipe line concerns. They refused to accept its oil, classing it as almost worthless. The price dropped to 30 cents per barrel and in many instances the oil never received bids.

As a result this field came to almost a shutdown. Refiners said the oil was worthless. The lack of a market for this heavy oil caused the scramble for lighter oils in Louisiana and in that way is responsible for development at Homer and Bull Bayou.

But some time during 1920, refiners began to learn things about Pine Island crude. They began to make fine lubricants from it. And the demand for Pine Island crude began to grow. The price began to jump and at one time there was a premium of 75 cents per barrel above the posted figure of $2.50 per barrel. The demand for fuel oil, no doubt, had much to do with the comeback of Pine Island.

This demand, of course, revived activity in Pine Island and there has been steady drilling there since. Wells shut down over a long period were reopened, cleaned and put on the pump. It has never been possible, however, to bring these wells back to the figure of production they held when the shutdown came. This field, the whole Caddo field, was once making 45,000 barels daily. It has been around 15,000 barerls since the revival of activity.

The Pine Island district has more undrilled territory than any other of the North Louisiana fields. With oil at its present figure it should be producing over a long period.

North Louisiana has been the scene of an extended wildcatting campaign. At one time 150 wildcat wells were being drilled. So far none has found oil, and the number of wildcat drilling wells has fallen off. Salt water has been the chief trouble with these wildcat tests, although many of them have been dry.

The Louisiana territory is salt dome structure, and its oil pools are small. The belief is common that the state has yet other rich oil pools.

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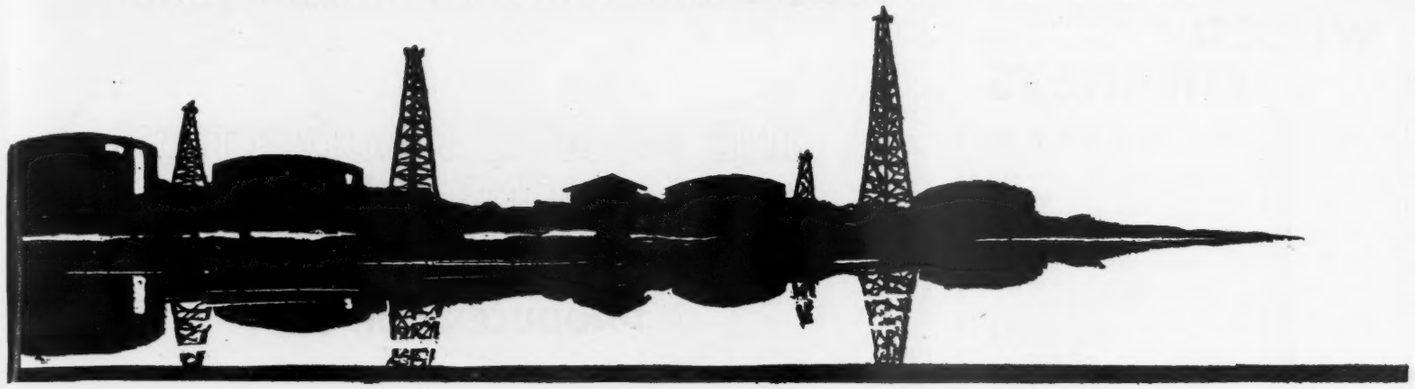


Electra Leads North Texas Fields

Second oldest oil producing district ahead of other fields in aggregate number of barrels; Burkburnett leads in daily production

WICHITA FALLS, TEXAS, Oct. 20.—With a grand total of production now approaching the 50,000,000 barrel mark, the Electra field, second oldest of the greater Wichita group, leads all other North Texas pools in gross production.

Just now the Electra field is going its 10,000 barrels daily, being surpassed by the Northwest Extension, the Townsite pool and the Old Field of the Burkburnett district. But Electra had its day early in the oil rush of North Texas, having come upon the scene in April of 1911, when the Woodruff-Putnam interests completed a well for 260 barels at 1630 feet. That well is still producing, being good for five barrels daily.

Electra, however, is not the oldest of the North Texas fields. That honor goes to the Petrolia district, scene of the big gas wells of later years. Petrolia began to produce oil in 1904. Records on the field are not available. Petrolia now yields 340 barrels daily, being less than one barrel for each of its 490 producing wells.

Given the privilege of combining its pools, the Burkburnett district would lead in North Texas production, for the various pools of that district had produced a gross total of 51,726,000 barrels of crude oil when the accompanying tables were compiled September 1, 1920. By this time the figure is near 53,000,000 barrels.

Burk Leads In Daily

And that is not half the story, for Burkburnett is now leading other North Texas fields in production. It does not require any great stretch of the imagination to draw on the day when the Burkburnett pools will have given up 100,000,000 barrels of crude oil. The average daily yield of the various pools is in the neighborhood of 70,000 barrels.

The first honor on acreage yield goes to the Townsite pool of the Burkburnett field, where on September 1 the average return from each of 1190 acres of the pool had been 11,475 barrels. By this time the production has passed the 12,000 barrel mark for each acre. Geologists and engineers have estimated that the proven area of the Burkburnett townsite held upon discovery 30,000 barrels for each acre.

Regardless of what the rich Townsite sand held in crude petroleum, it is an accepted fact that it is considered the richest oil sand ever found in Texas.

Some veteran operators of various American fields said, "I believe it was the richest oil sand the world ever saw. After a week out in the sun you could take it in your hand and squeeze oil out of it.

"But, oh, how they ruined it! They perforated the surface. They drilled enough wells for five fields of its size."

With that the veteran operator threw up his hands in silence. He is now down in Stephens County, where the wells are often better producers, always deeper, always cost more and not of least consideration, where they are also farther apart.

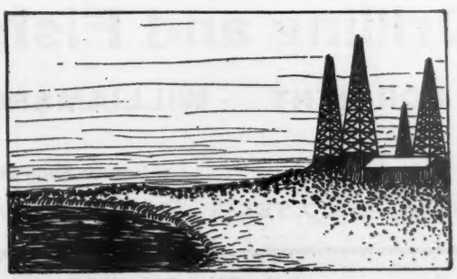
But the Townsite sand is rich. There is also a wealth of it. Its thickness is estimated at from 25 to 45 feet for an average. In some instances the drills went into as much as 60 feet of rich sand without going through it.

If the Townsite pool did hold 30,000 barrels of oil for each acre, there is yet 21,000,000 barrels of oil to be taken from beneath the 1190 proven acres.

Northwest Field Figures

The Northwest Extension has produced more than any other of the Burkburnett pools. Its gross total of 24,000,000 barrels has been taken from 3680 acres of proven field, an area three times larger than the older Townsite pool.

The Electra field holds first place in area, having 9066 proven acres. All the Burkburnett pools have a combined total acreage of 13,597 acres. The old pool of the group leads with 7558, being second to Electra in size.



The average daily production of wells in the various fields at present varies from the 49 barrels for the K-M-A field down to the one barrel per day for each well of the Petrolia field. Kemp-Munger-Allen is the newest of the fields around Wichita Falls and its higher avearge of production is accounted for in that. In sand thickness the K-M-A field does not compare with other fields of the district, as the average thickness there is not more than six feet.

In the Northwest Extension the wells still have an average daily production of 35 barrels each. The Townsite wells are averaging 26 barrels each, while those in the Texhoma pool are doing one barrel better. In the older Electra field the average is down to 8 barrels per day.

Three Discovery Wells Dead

It is interesting to note that only three of the discovery wells of the various fields have ceased production. The Culberson well on the Wattoner farm, where the South Electra pool was discovered March 15, 1914, is dead. The discovery well of the shallow Iowa Park field. the Forest Oil Company's No. 1 Ferguson, drilled in as a 20-barrel producer January 27, 1913, is not now producing. Records are not available on the Petrolia field, so the present condition of the discovery well there is not known. Since that field was discovered in 1904, it is assumed that the well is dead.

The best well of the discovery group was the No. 1 Waggoner of the Burkburnett Oil Company, the first well of the Northwest Extension. Initial production of this well was 2750 barrels. The Fowler Farm Oil Company's No. 1 Fowler, first well in the Townsite pool, was good for 1600 barrels daily when drilled in. Other discovery wells have been small in production.

In all, 5555 producing wells have been drilled in North Texas fields against 1654 failures. The proven fields have 451 wells now drilling.

Detailed figures may be found on page 107, this issue.

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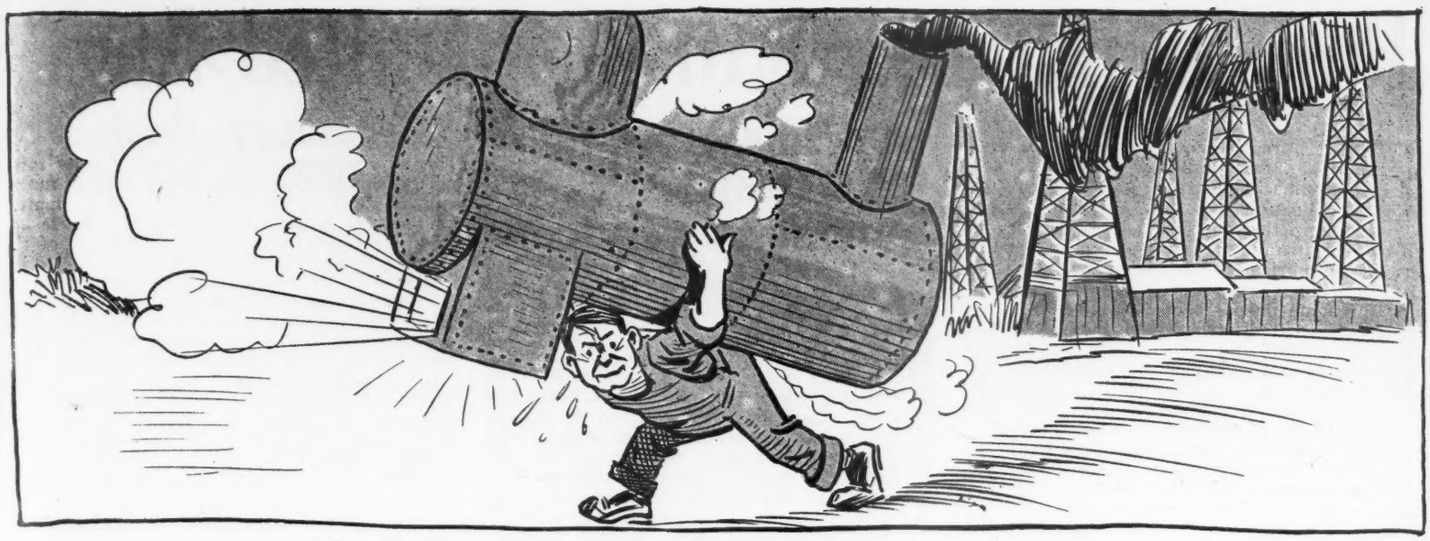


AND SO A GENTLE ROUGHNECK WAS SENT TO FETCH A NEIGHBOR'S BOILER

Oil Field Thievery Is a Fine Art

By Grady Triplett

THEY will steal anything in an oil field—anything except a dry hole or a standing derrick. And in the case of these exceptions, like the cause of a well known breakfast dish, there is a reason. Peace officers explain that a dry hole is worth nothing and that a standing derrick is not of sufficient value to tempt an oil field thief.

But the sheriffs of the oil counties of Texas have records to prove that everything else, excluding the above listed pair, has been stolen in the oil fields. Out in Eastland county his majesty the high sheriff estimates that a cold million dollars worth of casing has been stolen since the rush of the Ranger field. In Wichita county, the officers have no estimates on values. They know that just about everything on the list of oil field essentials has been stolen.

Really it is easy to understand about the dry hole and the standing derrick. Of what use is a dry hole, unless it be to cut into proper lengths and use for post holes? Nobody has time to build fences when an oil rush is on. So why steal a dry hole?

Derrick Too Unwieldy

Then there is a derrick. With all its height and such (particularly the such) it would be a rather awkward thing to handle unless knocked down. And scores of them have been stolen in the timber form. Besides, as the officers believe, a derrick is small meat to an oil field thief when such rich pickings as casing, pipe, boilers rigs and engines are on every hand.

Now the best story going the rounds at Burkburnett is the stealing of a boiler with the fire under it and the steam up. Furthermore, it happened. Any man will tell you that and he can tell you who told him.

Considering the fact that it requires a wagon of eight wheels and usually as many horses or mules to haul a cold boiler over an oil field, it does seem that the thieves had a warm job to load a hot boiler and make away with it while the crew did nothing but eat the night meal only a few yards distant. But that is just how it happened at Burkburnett. The crew went to supper and left the boiler hot. When they returned, they had no boiler.

The boiler was later found and returned. There was no prosecution. For the takers proved to be not thieves but borrowers. They had a well ready to be drilled in. Having no further funds and needing the well, they took a hot boiler and completed their well. There is no further evidence in the case; but to make it a good story, let us hope that the well proved a producer, that the company was saved from bankruptcy and that our hero married the sweet young thing and that they lived happily ever afterward.

Perhaps the case will not bear too rigid investigation. The men who took that boiler needed asbestos gloves as well as other articles of fire resistance. For a boiler will get hot. Ask the fireman.

No less startling is the case of the man who lost his house. He was not so fortunate as those who lost the boiler. This man also lived and labored in the Burkburnett field. He went away to his work on a nearby lease one morning and returned that night to find only the location of his place of abode.

But He Couldn't Find It

When he reported his loss, he stated that he would know his own house, even if he found it in the wilds of Borneo. With the officers he rode the field over, north and south and east and west. But he never found his house. It is one of the numerous mysteries of the Burkburnett field.

Now comes the best yarn as to trucks. Trucks have been stolen in whole and in part in every oil field in the country. But the man who drove his truck to a lease and started unloading casing has left the best story of that sort of thievery. When he had finished unloading, he cranked the engine and started away. Forthwith the rear axle on the opposite side from that of unloading his wares, promptly struck the ground.

The wheel was gone. While the truck was being unloaded, some thief had placed his jack under the axle, removed the wheel and escaped. What the truck owner did has never been told. It was another case of extreme loss in an oil field.

One company in the Burkburnett field lost its rig, a 100 barrel fuel tank, a half mile of two-inch tubing and the hole was junked by thieves trying to pull the six-inch that was left standing in the well. The loss was discovered when the company's representative went out to pay his monthly visit to the well.

A little thing like stealing is of small consequence in an oil field. It is a different sort of crime that arouses the ire of drillers and helpers.

Out on a certain lease in one of the Texas fields, the crew, following ancient and honorable precedent, had its dice game as regularly as pay day. And the game sometimes continued for a few nights thereafter. As regularly as the ebony bones began to click, the hijackers came and proceeded to take all the money in sight.

Closer Connection Requested

Then the next night, if the game continued, the keepers of the peace and dignity came and put an end to the rolling of the bones. It happened that way for a long period. First the hijackers and then the law. Now the loss of the money was not of much moment—men who roll the Mississippi Marbles expect to lose. But it was disconcerting to have the game broken up.

So the crew met in caucus and drafted a paper. It was addressed to the sheriff and his deputies. It did not claim that this crew was being imposed on. But it did make the query, after stating the fact in the case, of why in the world the hijackers and the officers could not arrive at the same time just once.

Crime, particularly thievery, is perhaps the easiest game of the oil fields. An oil field is a bee hive of activity. There is much going to and fro and little of watching where the other fellow goes. For its area, the Burkburnett field of one year ago was perhaps the busiest place the world ever saw. There was something doing every minute and on just every foot of the field and not a little of it was thieving.

Stealing is not over. But the officers are having very few calls now. They explain that the market is not so good. Materials are not bringing such high premiums. Besides there is less activity and men can watch their materials. And again money is not so plentiful and men are forced to watch what they have.

The worst offender now is the oil thief. He is about the hardest thief the oil field strives to catch. His game is to take crude oil. And he takes it from flow tanks, storage tanks, pipe lines and even from wells.

(Continued on Page 240.)

Puncturing No. 1 in the United States

Drilling of 68-foot Well Interestingly Related by Helper

The accompanying account of the drilling of the original Drake well, which marked the beginning of the petroleum industry in America is valuable because it will serve as a historic reference for years to come. Henry Pease, superintendent of the schools at Titusville, Pa., wrote the account after he had numerous talks with Samuel B. Smith of that city. Mr. Smith assisted his father in putting down the well, and he is believed to be the only man living today who had any part in the work. His memory is entirely reliable and he testifies that the story as written by Mr. Pease is correct in every detail.

The article is reprinted from "The Lamp", publication of the Standard Oil Company of New Jersey, to which The OIL WEEKLY is indebted.—Editor.

THE precise spot for locating the original Drake well was selected because at this point a pool of surface oil had collected for years. Oil was pumped from this pool for the sawmill of the Brewer-Watson Company near by and was used for lubricating the machinery and for lighting the mill at night. It was also used for the same purposes in another mill of the company situated farther down the creek. The amount secured did not exceed one or two gallons per day. None of it was used for medicinal purposes.

The task of putting down the Drake well was in charge of William A. Smith, father of Samuel B. Smith. Mr. Smith came to Titusville from Tarentum with his family for the express purpose of drilling this well. He had three sons who were employed about the work, but only the youngest, Samuel B., actually helped in the drilling. He was then a lad of sixteen years. The other sons assisted in getting the work developed to the point where the drill was started. The actual drilling was a comparatively short process, occupying only about a week. The big part of the labor was expended on the preparatory activities. These consumed several months.

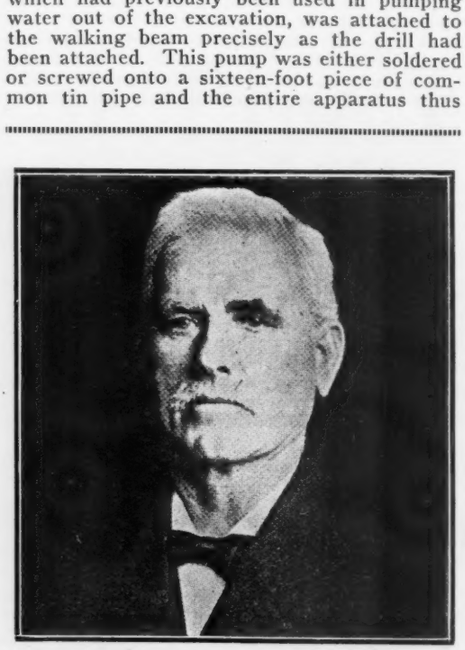
Engine Hauled From Erie

The Rock Oil Company had executed a contract with the Brewer-Watson Company for the privilege of putting down the well before Mr. Smith left Tarentum. He had been a driller of salt wells in that field and was selected by Colonel Drake because of his efficiency and skill. He was a general all round mechanic, able to turn his hand to almost any job needed in the preparatory work and during the drilling and subsequent developments. He reached Titusville in April, 1859, and took immediate charge at the site of operations. All the machinery was driven by a steam engine which was made in Erie and hauled by horses from Union City, a distance of twenty-two miles. This was a six horsepower stationary engine, using wood for fuel. The same engine was afterwards used to pump the well. Many people suppose that the Drake well was "kicked" down but this method of drilling was not employed until after the Drake well was brought in. It was very common in Oil Creek valley for several years after the discovery of oil, but the Drake well was drilled by steam power.

A derrick had been erected before the arrival of Mr. Smith. He immediately began excavating for the purpose of reaching the solid rock, as no previous activities in the valley had required finding it. A hole six feet in diameter was carried down sixteen feet, when the continual flow of water in large quantities compelled a change in procedure. It was necessary to send for pipe, probably to Erie, and so operations came to a standstill for some time, as travel and transportation were slow and difficult.

At first two lengths of six-inch pipe, each eight feet long, were driven down, but failed to find solid bottom. Then thirty feet of four-inch pipe was driven inside the six-inch pipe, but with no more satisfactory result. Another trip after pipe became necessary with all the consequent delay. The six-inch pipe and the four-inch pipe was all drawn out and driving began again with six-inch. After putting down forty-seven feet of six-inch pipe the solid rock was found and preparations were immediately made for drilling. The preliminary work, together with the necessary delay in securing and transporting the pipe, had consumed the time until August.

After the drill had been going a week, Mr. Smith discovered oil foaming up in the pipe and immediately stopped the drill. The tools were removed and a common Pitcher pump, which had previously been used in pumping water out of the excavation, was attached to the walking beam precisely as the drill had been attached. This pump was either soldered or screwed onto a sixteen-foot piece of common tin pipe and the entire apparatus thus constructed let down inside of the six-inch pipe. These preparations for pumping took only a few hours. Whether pumping was begun the same day that oil was discovered or was delayed until the next day, Mr. Smith is not certain.



SAMUEL B. SMITH OF TITUSVILLE, PA., WHO HELPED WITH FIRST OIL WELL

But there was little or no excitement either at the well or in the borough. No one appreciated what had been accomplished. All accounts of the rush of the family from town to the well and the story of the Sunday morning surprise are pure invention. As a matter of fact, the Smith family lived in a house not fifty feet from the well and they knew of the discovery of oil as soon as made.

The well started pumping at about fourteen barrels per day, and the output remained about the same for several weeks. At first it brought a dollar a gallon, but of course the price soon declined with the sinking of other wells. The Pitcher pump continued to do duty until it was removed to allow tubing to be placed in the well. The bore below the forty-seven feet of six-inch pipe was three and three-fourths inches. Copper tubing, such as was used in the salt wells at Tarentum, was put down into the smaller part of the bore. A pump with a working barrel was installed and attached to the same walking beam.

Production Is Increased

With the improved equipment, the production at once rose to twenty barrels per day. At first the oil was stored in barrels, any type of barrel being utilized which would hold oil. Work was immediately begun on two storage tanks, or vats, as they were called. They were rectangular, four feet high, the smaller about eight by ten feet, the other about twelve by twenty.

In October everything above ground at the well was destroyed by fire, including the house in which Mr. Smith and his family were living. The blaze was started by the ignition of gas when Mr. Smith carried a lighted lamp to the well to determine what was wrong, as it was not pumping properly. The possibility of trouble with natural gas was not then understood. During the fire the boiler of the engine at the well exploded. When operations were resumed, a portable engine was used until Mr. Smith repaired the exploded boiler. An entire new plant was built and pumping resumed as soon as possible.

The surprise of the calamity came in the form of an increased production. It now started off at about thirty barrels per day and continued at this for some time, but of course it gradually declined. So far as Mr. Smith can recall, at the end of about three years it was four barrels. During this time, the well had been sunk to a depth of four hundred and fifty feet, but without increasing the production. The original depth of sixty-nine feet was ample to get all the oil it could produce. Other wells in this field were from four to five hundred feet deep. Two more were drilled very near the first well. One proved a dry hole and the other was pumped with the same machinery used in pumping the Drake well. Mr. Smith supervised the drilling of these wells at the same time that he continued in charge of the Drake well.

Has One Relic of Well

At the end of three years Mr. Smith moved with his family to a farm which he owned in Butler County. When he left, Colonel Drake presented him with all the drilling tools used in putting down the original well, except the auger stem and the sinker bar. Mr. Smith has a small anvil which his father made from one of the rimmers. It is about ten inches long and has always been in the possession of Mr. Smith. So far as Mr. Smith knows, this is the only remnant of the original tools. All the others were lost, loaned, or used for other purposes. Mr. Smith is absolutely certain that none of the tools sometimes exhibited as those used in drilling the first well are genuine.

So much has been said about the men who assisted in putting down the Drake well that it may be a matter of some interest to know that Mr. Smith has a very distinct recollection

American Operators Harrassed in Palestine

British Authorities Seek Petty Excuses To Delay All But English Prospectors

REGARDLESS of official denials and diplomatic statements here is first hand information as to the British effort toward monoply of foreign oil fields. Below are some extracts of letters written by an American oil operator, now in Palestine, to a friend in the United States.

This man is still waiting for a chance to inspect prospective oil properties in Palestine. One paragraph of his letter reads as follows:

"It is now a year since I landed in Palestine, and still the British foreign office has not seen fit to give a yes or no reply. From all indications it will take them another year to decide and then we will undoubtedly be ordered to vacate this part of the world, as concession requirements will be so harsh that it would be impossible to operate."

That the American prospector for petroleum in the Holy Lands is having his troubles with those in official British circles can be seen from the following:

"But please remember one thing, and that is that there is not a greater liar on earth than the present English ambassador here. The lie should be cast down his throat when he says and Mesopotamia. He seems to forget that a leading London geological firm has had a representative here several times and that other English geologists have been here examining the region. Furthermore, he has probably not been informed that there were English geologists working in Mesopotamia and that when our men arrived in Bagdad, these British civilian geologists were put in the army and permitted to carry on their examinations."

Then here is some information from another letter. It tells what is happening under British rule in those ancient lands, what is likely to happen and gives the American oil operator a hint as to what should be done about South America.

"The mandate for Palestine has been awarded to the British, but so far we have had no word regarding the status of concessions to American interests. The Mesopotamian award, however, will probably establish a precedent upon which to base a decision on those of Palestine. From the papers I learn that the Mesopotamian fields have been awarded to the Anglo-Persian and the Royal-Dutch group, with the French holding a minor share in the agreement with the secret treaty of Asia Minor division.

"By this decision the Americans are excluded from those fields, while since 1903 we have been excluded from the Persian fields. Naturally it is up to all American companies to absorb the promising areas of South America."

That the American finds Palestine ideal in climate, although infested with flies and mosquitoes is shown:

"The climate of the Palestine highlands is ideal. I doubt whether you can find a more invigorating climate anywhere, although we do have heaps of dust, flies and mosquitoes. I have been enjoying good health.

"Some of my companions have become disgusted and will return home in September. I am strongly tempted to return, but I am afraid that to do so would appear childish, and that it probably would mar my future."

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of all who were in any way connected with the work. When the senior Mr. Smith came to Titusville to take charge of operations he found Gordon Redfield employed in preparatory arrangements. He was probably employed afterwards when extra help was needed, but was not retained as a regular helper. A derrick had previously been erected by Samuel Sullivan and he was afterwards employed to build the two storage tanks or vats. A Mr. McClellan had been employed to assist Mr. Redfield before the arrival of Mr. Smith, but he was not retained. A Mr. Small was employed after the arrival of Mr. Smith to build a wall for the engine boiler. With the exception of these men, the labor of putting down the well was performed by William A. Smith and his sons. S. B. Smith, the youngest son, is very positive about this.

Work Suspended At One Time

It is a matter of considerable interest that at one time work was suspended at the well by direction of Colonel Drake, in order that a search might be instituted for coal mines along the banks and bluffs of Oil Creek. But this was not long continued, as the prospects of striking oil were better than those of finding coal.

The site of this first well is now marked by a huge boulder of native sandstone, placed by Canadohta Chapter of the Daughters of the American Revolution. It is located less than a mile southeast of Titusville in the Oil Creek valley, a few hundred yards from the stream.

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Say you saw it in THE OIL WEEKLY

PIPE LINES FOR OKLAHOMA AND TEXAS SHOWN BY LIST

(Continued from Page 229.)

the size pipe in most instances and this gives a good idea of the capacity of the lines. The size indicated below is for the major part of that used in the lines but not necessarily all of it.

Also, figures shown here represent only Oklahoma mileage of lines that are operating in other states as well.

Pipe lines are listed in Oklahoma as follows:

Name of Company	Trunk Lines miles	Gath. Lines miles
Alluwe Oil Co.—Alluwe district in Oklahoma to Coffeyville, Kan. (2" and 3")	40.2	25.67
Anderson & Gustafson	....	13.24
Armstrong, C. R.	....	7.50
American	....	14.87
Ark. City Pipe Line Co., Devol, Okla.	....	....
American Pipe Line Co., Caney, Kan.	....	....
Cosden Pipe Line Co.—From various Oklahoma fields to West Tulsa (3", 4", 6")	313.42	412.94
Champlin Pipe Line Co.	....	14.16
Coline Oil Co., Ardmore district	....	....
Crescent Refining Co.	....	14.5
Crown Oil Co.	....	22.67
Empire Pipe Line Co. (8")	384.01	322.76
Enid Pipe Line Co.	....	23.94
Gulf Pipe Line Co. of Okla.—Bartlesville to Texas-Oklahoma boundary; Oklahoma-Texas State line to Port Arthur, etc. (4", 6", 8")	519.42	491.30
Great American Refining Co.	....	21.77
Healdton Oil Co. (4", 6")	50.40	....
Humphries	....	17.44
Indiahoma Pipe Line Co.	....	71.80
Kay County Gas Co.	....	....
K. & C. Pipe Line Co., Philadelphia	....	....
Magnolia Pipe Line Co.—Cushing to Addington; Healdton to Fort Worth, Tex., etc. (2", 6", 8", 10")	398.88	272.49
Modern Refining Co.	....	8.96
Motex Pipe Line Co.	2.99	....
Milliken Pipe Line Co.	74.88	....
National Refining Co. (4", 6")	181.63	139.98
Yarhola Pipe Line Co.—Roxana, North Oklahoma to St. Louis (6", 10")	313.75	....
Oklahoma Pipe Line Co.—Creek County to McCurtain, etc. (4", 6", 8")	440.80	193.72
Pierce Pipe Line Co. (3", 4", 8")	26.75	29.65
C. O. Pierce Pipe Line Co. (6")	31.75	42.98
Pure Oil Co.	....	54.95
Pan-American Pipe Line Co.—Quay district to Tulsa, etc. (6")	39.35	....
Prairie Pipe Line Co.	....	....
Ryan Petroleum Co.	21.08	....
Riverside Refining Co.	....	7.06
Ramsey Oil Co., Caney, Kansas	....	....
Sinclair Gulf Pipe Line Co.	600.62	....
Shaffer, C. B.	....	65.
Signal Pipe Line Co.	....	....
South Oklahoma Pipe Line Co.	....	....
Texas Pipe Line Co. of Okla. (2", 8")	429.70	955.30
Uncle Sam	....	144.50
Wichita Pipe Line Co.	....	....

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OIL FIELD THIEVERY HAS DEVELOPED INTO FINE ART

(Continued from Page 237.)

Over a stretch of twenty miles of gathering lines, there are countless openings for the tapping of a line. And the lines are tapped countless times.

The worst oil thief is the one who works the low average system. He gets a good connection where the lines cross at many angles. Then he takes a few barrels each night. His total is so small that it would make but little difference in the grand total for the pipe line concern. But he works regularly and in time gets sufficient oil to protect himself from the cold of winter.

As for timbers, rigs, rig iron, pump jacks, gas engines, sucker rods, working barrels, wire cables, drill stem, fishing tools, rotary bits and the like, thieving cases are so numerous they are not worth the mentioning.

As for the case of the hot boiler and the oil field bungalow, you can believe that if you like. Just about anything can happen in an oil field and most of it does. Only the skeptical or those far distant from oil territory will arise of a sudden to brand the two as untrue.

Anyway they make good stories. And they prove that there has been and still is a lot of stealing in the oil fields. Where there is such black smoke, there must be a lot of fire. The choice stories may be only smoke. But the oil fields have seen more than their share of thievery and it continues. Perhaps it will as long as oil flows.

Perhaps some day, when derricks are worth more, a standing derrick will be skidded across a field and thereby placed in the list of stolen property.

Perhaps it may come about that a means will be found of stealing a dry hole—anything can happen in an oil field.

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OKLAHOMA WILDCATS

(Continued from Page 93.)

Kennedy, southeast 5-5-9w, sd 2160 ft; Carron et al's No. 1 Lackey, northwest 11-5-9w, pipe stuck at 1919 ft. Fortuna Oil Co.'s No. 2 Lindsay, southeast 26-6-10w, dr 2350 ft. F. & B. Oil Co.'s No. 1 Fugat, southwest 35-6-9w, rigging up. Gorten Trust Co.'s Nos. 1 Marchland, northwest 2-5-9w, dr 925 ft; 5 Wade, southeast 2-5-9w, cleaning out; 6 Wade, cementing casing 2295 ft; 2 Rigney, bldg rig. Invincible Oil Corp.'s Nos. 1, southeast 1-5-10w, setting casing 1815 ft; 5 Big Whip, southeast 3-5-9w, skidding rig 21 ft to the north, lost hole at 1800 ft; 1 McClaren, southeast 6-5-9w, rigging rotary. Kichi Oil & Gas Co.'s No. 1 Day, 32-6-9w, dr 450 ft. Le Master Bros.' No. 1 Perry, northeast 36-6-10w, sd 1940 ft. Lawhead et al's No. 1 Kenna, southeast 11-5-9w, sd 1200 ft. Lone Star Gas Co.'s No. 2 Lackey, northwest 11-5-9w, trying to shut off water 2459 ft. Magnolia Pet. Co.'s Nos. 1 Edwards, southwest 25-6-10w, sd 1675 ft; 2 Edwards, southwest 25-6-10w, dr 1220 ft; 1 P. Edwards, southwest 25-6-10w, timbers; 1 Sanner, 35-6-10w, bldg rig; 3 Miles, northwest 36-6-10w, loc; 1 Wagner, southwest 2-5-9w, cleaning out 1435 ft; 1 Moss, southwest 3-5-9w, dr 1200 ft; 1 Oldham, southwest 6-5-9w, trying to shut off water 3416 ft. Mid-western Oil Co.'s No. 2 Lackey, northwest 11-5-9w, dr 2500 ft. National Oil & Refining Co.'s No. 1 Lackey, northwest 11-5-9w, dr 1925 ft. Omaha Drilling Co.'s No. 2 Perry, northwest 3-5-9w, rig. J. E. Rummell's No. 1 Livermore, northeast 10-5-9w, loc. Two Hatchets Oil Co.'s No. 1 Dickey, southwest 1-16-12w, dr 2820 ft. Williams et al's No. 1 Kinzmiller, southwest 32-6-9w, dr 3687 ft.

CIMARRON COUNTY—Campbell-Riley et al's No. 1 School Lands, 22-5-5e, sd 1150 ft|

CLEVELAND COUNTY—Cleveland Dev. Co.'s No. 1 Braman, southeast 31-9-1e, sd 2700 ft. Machlenberg's No. 1 Machlenberg, northwest 22-8-1e, sd 1800 ft.

CUSTER COUNTY—Arrenback et al's No. 1 Williams, northwest 1-14-14w, dr 700 ft. Mull & Jennings' No. 1 Rogers, southwest 9-14-14w, spudded and sd. Payne et al's No. 1 Schreck, southwest 9-13-14w, sd 650 ft. Price & Pringrey's No. 1, southeast 36-15-18w, dr 475 ft. Parker Oil & Gas Co.'s No. 1 Ruth, northwest 1-15-15w, skidding rig, lost the hole. Union National Oil Co.'s No. 1 Steele, northeast 30-13-16w, sd 800 ft. Harry Van Ness Synd.'s No. 1 Knight, southeast 22-15-16w, sd 850 ft.

ELLIS COUNTY—Utility Oil & Gas Co.'s No. 1 Meegan, southeast 32-24-24w, sd 310 ft.

GARVIN COUNTY—Broadgate Oil Co.'s No. 1 Abrams, southeast 23-1-3w, sd 2983 ft. Gilliland Oil Co.'s No. 1 Lasiter, northwest 2-2-3w, rigging standard tools. Magnolia Pet. Co.'s Nos. 1 Hodges, northwest 9-1-3w, dr 1305 ft; 1 Harris, northeast 22-1-3w, dr 1006 ft; 1 Gibson, southeast 21-1-3w, dr 1320 ft; 1 Dawney, northeast 22-1-3w, dr 925 ft. Nicholson Oil & Gas Co.'s No. 1 McLain, southeast 24-2-1w, sd 3058 ft. Ole Oil Co.'s No. 1 Hines, northwest 35-4-1e, sd 2205 ft. Wrightsman Oil Co.'s No. 1 Richards, northeast 16-1-3w, co 1381 ft; 3 Richards, rigging up.

GRADY COUNTY—T. J. Cannon Drilling Co.'s No. 1 Todd, northwest 2-4-5w, dr 175 ft. Innes et al's No. 1 Slayton, northeast 35-4-7w, dr up pipe 1775 ft. M. C. K. Oil Co.'s No. 1 Schoch, 1900 ft oil in hole, no gas, 2476 ft. Unity Oil Co.'s No. 1 Cooper, 18-5-5w, sd with water trouble 3176 ft.

GRANT COUNTY—C. H. W. Oil Co.'s No. 1 Sparks, southeast 27-29-3w, rig burned. F. H. Griggs et al's No. 1 Long, southwest 22-29-4w, sd 860 ft. Green-Wyoming Oil Co.'s No. 1 Miller, northeast 36-28-4w, moving in tools. National Union Oil Co.'s No. 1 Redman, southwest 33-28-3w, dr 2585 ft. Oklahoma Nat. Gas Co.'s No. 1 Couch, northwest 23-27-3w, dr 100 ft. Western States Oil Co.'s No. 1 Flood, southeast 23-27-3w, ur 1100 ft.

HARPER COUNTY—St. Louis Buffalo Oil Co.'s No. 1 Tucker, southeast 9-27-22w, setting casing 1846 ft.

KINGFISHER COUNTY—Simmons Oil Co.'s No. 1, northwest 13-19-8w, sd 1085 ft. Leibee et al's No. 1 Bugg, southwest 1-18-8w, sd 1600 ft.

KIOWA COUNTY—Centralized Oil Co.'s No. 1 Schmidt, southeast 27-7-16w, sd 1734 ft. St. Louis Oil & Gas Co.'s No. 1 McConnell, northeast 34-7-20w, sd 1815 ft.

LINCOLN COUNTY—Cosden Oil & Gas Co.'s Nos. 1 Pylant, northwest 2-16-4e, dr 2190 ft; 1 Lindsay, northeast 6-16-5e, dr 350 ft. Magnolia Pet. Co.'s No. 1 Long, southeast 6-15-5e, casing trouble 1595 ft. Roxana Pet. Co.'s No. 1 Randolph, southwest 17-16-5e, dr 1350 ft. Security Oil Co.'s No. 1 Powell, northwest 17-15-3e, sd 1405 ft. Stroud Oil & Gas Co.'s No. 1 Scheiff, 21-14-6e, ur 750 ft. Savoy Oil Co.'s No. 1 Johnson, northeast 35-12-6e, fsh 2360 ft.

LOGAN COUNTY—Empire Gas & Fuel Co.'s No. 1 Vicks, southeast 15-15-1w, ur 3475 ft. Mulhall Oil Co.'s No. 1 Wyant, northwest 9-18-2w, sd 1300 ft. Owen et al's No. 1 Newman, northeast 32-19-3w, spudded and sd.

LOVE COUNTY—J. M. Noble's No. 1 Alexander, 32-6s-1w, fsh 2855 ft. Shaffer Oil & Ref. Co.'s No. 1 Rose, southeast 6-7s-1e, rig.

MAJOR COUNTY—Campbell-Clawson et al's No. 1 Davidson, southwest 10-21-13w, rig up over old hole, 1070 ft.

MARSHALL COUNTY—Kingston Dome Oil Co.'s No. 1 Thomas, northwest 2-7s-5e, sd 1900 ft. Sacra Oil Co.'s No. 1 Sacra, southwest 17-5s5-e, sd 1960 ft.

McCLAIN COUNTY — Rosedale Oil Co.'s No. 1 Thompson, center 36-5-1e, dr 2250 ft.

MURRAY COUNTY—Choate Oil Corp.'s Nos. 1 Wolfe, 7-1n-2e, rig; 1 Tarbee, southwest 17-1n-3e, dr 100 ft. Moran et al's No. 1 Richards, southwest 6-1n-1e, sd 100 ft. Stuyvesant Oil Co.'s No. 1 Ashton, southwest 7-1n-3e, show of oil 1834-40 ft, water 1988 ft, dr 2020 ft.

OKLAHOMA COUNTY — Noggel et al's Nos. 1, southeast 17-14-3w, sd 2014 ft; 2, southeast 17-14-3w, dr 600 ft. Oklahoma City Oil Co.'s No. 1 Miller, southeast 34-13-4w, spudded and sd. State Center Oil Co.'s No. 1 Norwell, southeast 29-13-1e, sd 1650 ft.

PITTSBURG COUNTY—Hailey et al's No. 1 Halloway, northwest 35-4-13e, sd 1850 ft. Wilkerson's No. 1 Smith, southeast 32-2-15e, sd 1410 ft.

PONTOTOC COUNTY—J. D. Abbott's No. 1 Ford, northwest 24-4-6e, sd 2000 ft. Daokla Oil Co.'s Nos. 1 R. Ford, southwest 17-4-8e, sd 502 ft, no sand; 2 B. Ford, northeast 20-4-8e, dr 950 ft. Harvey Crude Oil Co.'s No. 1 Jones, 17-4-4e, spudded and sd. Kingwood Oil Co.'s No. 1 Oliver, southeast 36-5-6e, ur 1225 ft. Lee Oil Co.'s No. 2 Cummings, northwest 25-5-8e, dr 550 ft. Lawrence Oil & Gas Co.'s No. 11 Denar, southwest 27-5-8e, fsh 500 ft. Lasalle Oil Co.'s No. 1 Whipple, southeast 16-4-5e, sd 100 ft. Montrose Oil & Ref. Co.'s No. 1 Warfle, northeast 20-5n-8e, rig. Tidal Oil Co.'s No. 5 Gray, northeast 28-5-8e, rigging up.

POTTAWATOMIE COUNTY—Maud Oil Co.'s No. 1 Davis, northeast 18-7-5e, sd 2700 ft. Wallace et al's No. 1 Diets, northwest 22-8-2e, dr 2930 ft.

SEMINOLE COUNTY—Westheimer et al's No. 1 Scroggins, 26-5-7e, dr 1200 ft.

TEXAS COUNTY—Beaver Oil & Gas Co.'s No. 1 Wells, 16-1-17e, sd 400 ft. Home Dev. Co.'s No. 1 Allison, southwest 4-1-12e, rig down.

WASHITA COUNTY—Rita Oil Co.'s No. 1 Joyce, southwest 21-11-19w, skidding rig. Enid Garber Oil Co.'s No. 1 Wilkinson, northeast 20-18-16w, rig.

WOODWARD COUNTY—Enid Standard Oil Co.'s No. 1 Holoway, southwest 34-25-19w, sd 3200 ft. Sen Burke Oil & Gas Co.'s No. 1 Winters, northwest 16-20-20w, sd 670 ft.

The Oil Industry of Texas
has been specially
SERVED
By the ----------

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Unusually large Savings have been effected in the Cost of Workmen's Compensation for the Industry, amounting to many hundreds of thousands of Dollars - and the Service is unique. A wonderful State wide Organization is available. ----------

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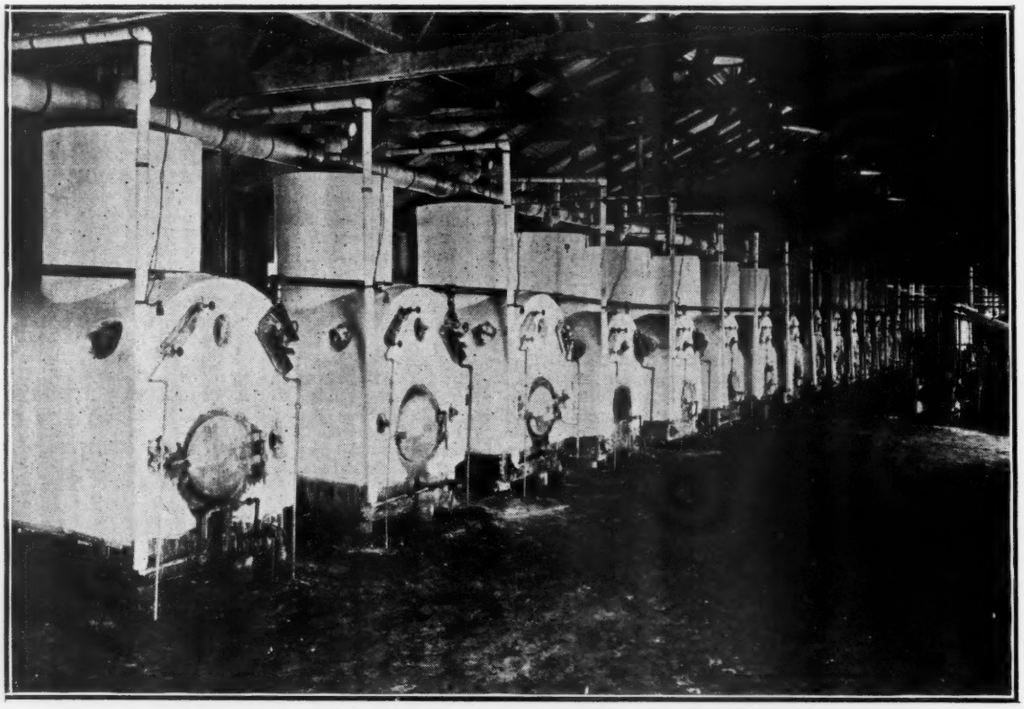

Boilers insulated by E. M. Rogers in plant of Humble Oil & Refining Company at West Columbia, Texas

NOTE THE PHOTOGRAPH. It shows what the Humble Oil & Refining Company thinks of insulation. And in addition to this, we are covering and have covered boilers in pumping stations and drilling rig boilers for the Texas Company, E. F. Simms & Company, Sinclair Oil Company, and numerous others. Authentic reports in saving of oil on a 45 h. p. oil field type boiler shows a saving of two barrels of oil per day for 24 hours operation.

LOOK AT THIS—In 1918 we did 70 per cent more insulation work than in 1917. In 1919 we did 40 per cent more than in 1918. WE ARE HAVING OUR BIGGEST YEAR NOW.

INTERESTING FACTS — The monthly coal saving in dollars and cents by the use of 85% Magnesia Pipe Covering, per 100 lineal feet, on a 4-inch line under 100 pounds steam pressure is $14.05. Under 200 pounds steam pressure is $16.40. These facts are based on pipes carrying steam for 24 hours per day and 30 days per month with coal at $5.00 per ton delivered.

YOU CAN AFFECT THE SAME SAVING!

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Another instance of the variety of "GATX" equipment, which serves so many essential industries—a specially designed tank car for pickles in brine. Wooden tanks are made necessary by the chemical action of the brine upon metal.

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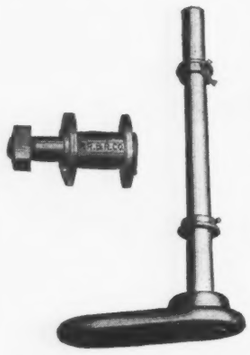

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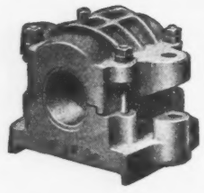

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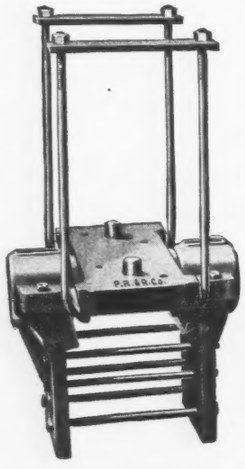

The Parkersburg Rig & Reel Co.

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- Standard Drilling Rigs with Bolted Derricks
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- Portable Bolted-Steel Tanks for Crude and Hot Oil and Gasoline Storage
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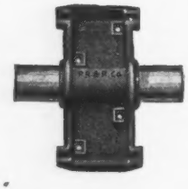

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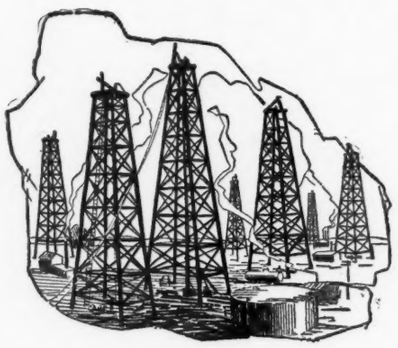

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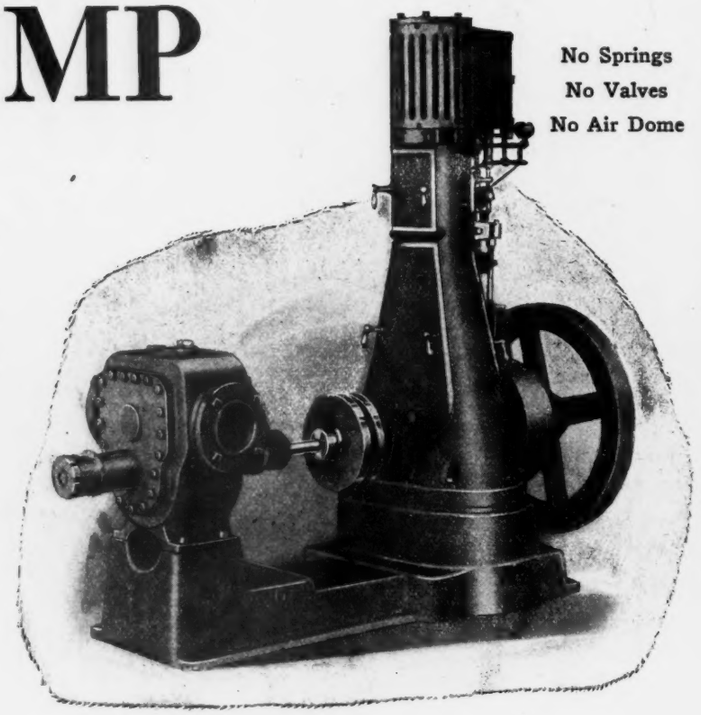

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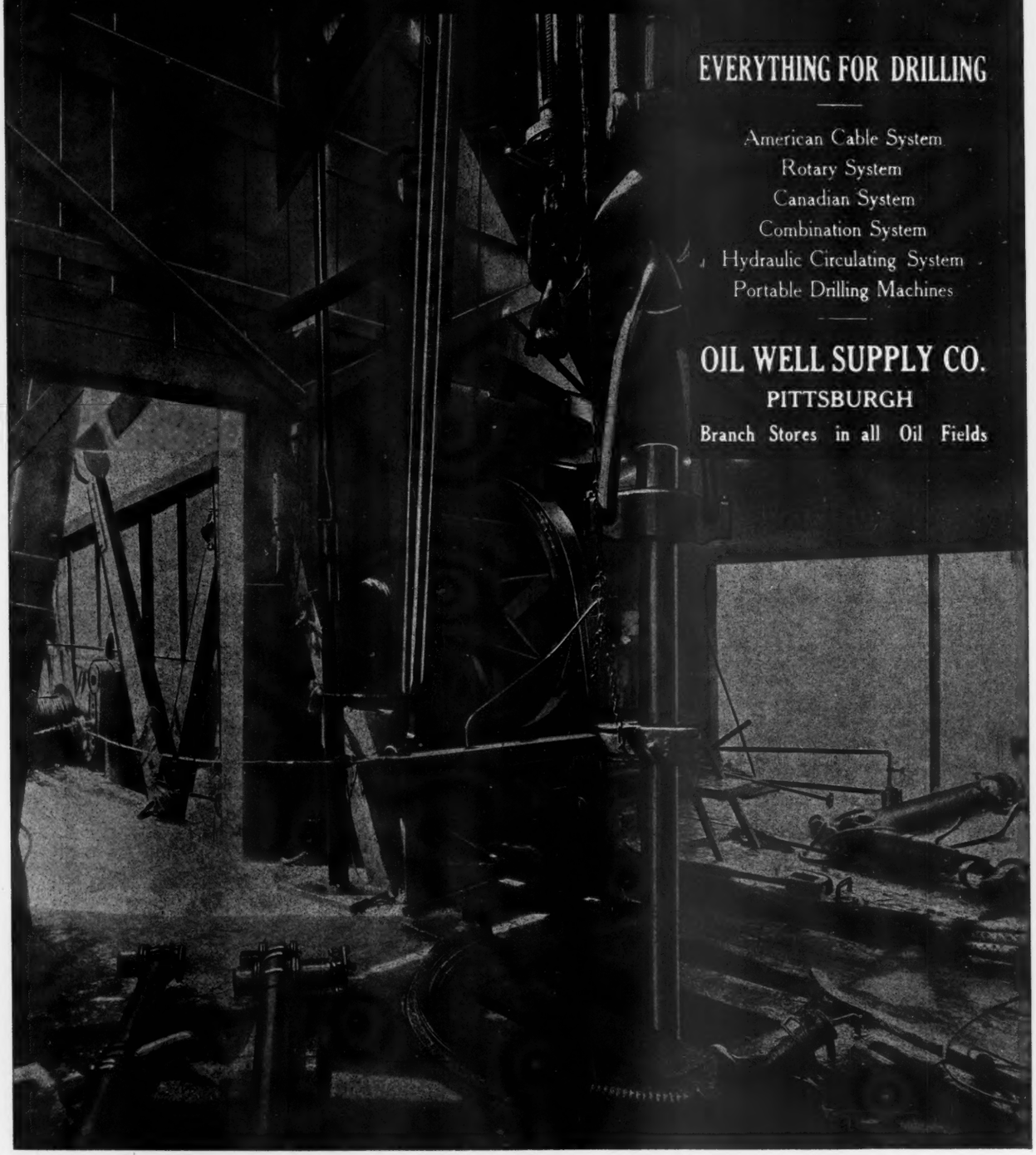

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"Easy on Casing"

Casing is costly. It is economy to use tongs that will not tear and crush it.

Again, dented or scored casing means **weakened** casing which, when set and bailed for any purpose, is more apt to collapse as a result of outside water pressure.

GUIBERSON-MILLS TONGS surround and reinforce the casing with a solid band of powerful steel. Users testify they are unbreakable, never slip, give long service, and will not injure casing.

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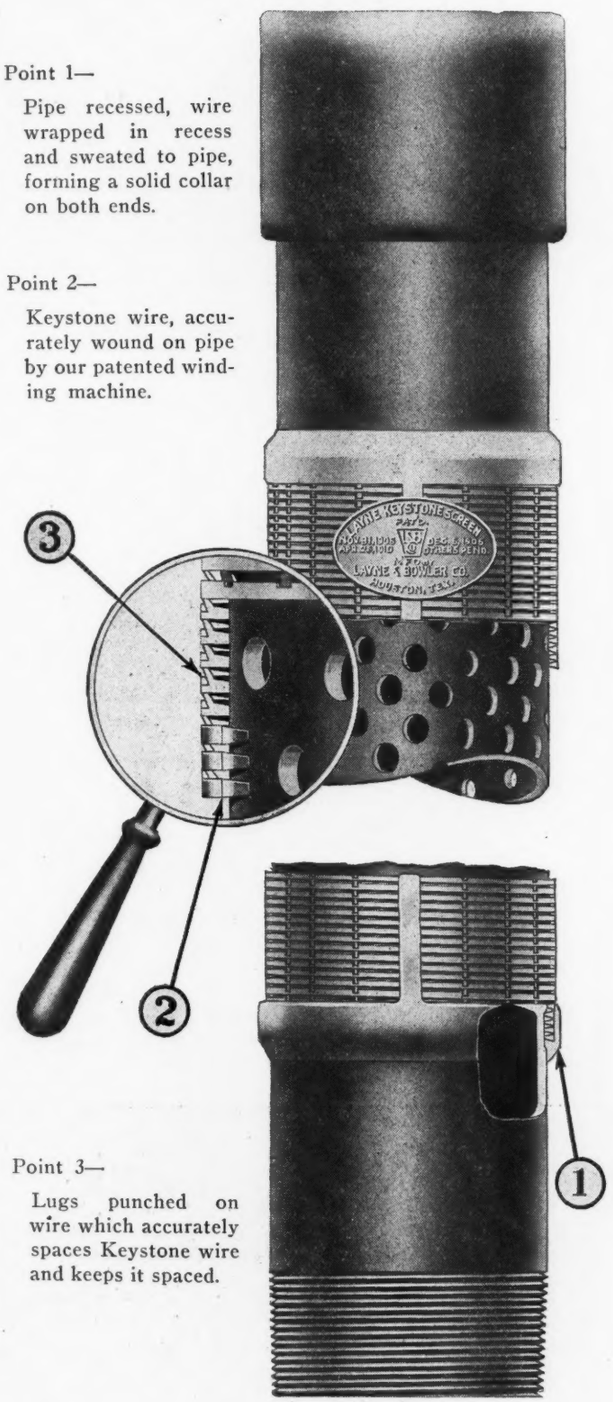
Pipe recessed, wire wrapped in recess and sweated to pipe, forming a solid collar on both ends.

Point 2—

Keystone wire, accurately wound on pipe by our patented winding machine.



Point 3—

Lugs punched on wire which accurately spaces Keystone wire and keeps it spaced.

The Layne Patent Keystone Wire Wrapped STRAINER FOR OIL WELLS

It is manufactured in brass or galvanized wire, any gauge to suit formations.

It is made on line and drill pipe and oil well tubing in sizes from 1 1-2 to 8 inches.

This screen is being used and has been used extensively by the principal oil companies for the past fifteen years.

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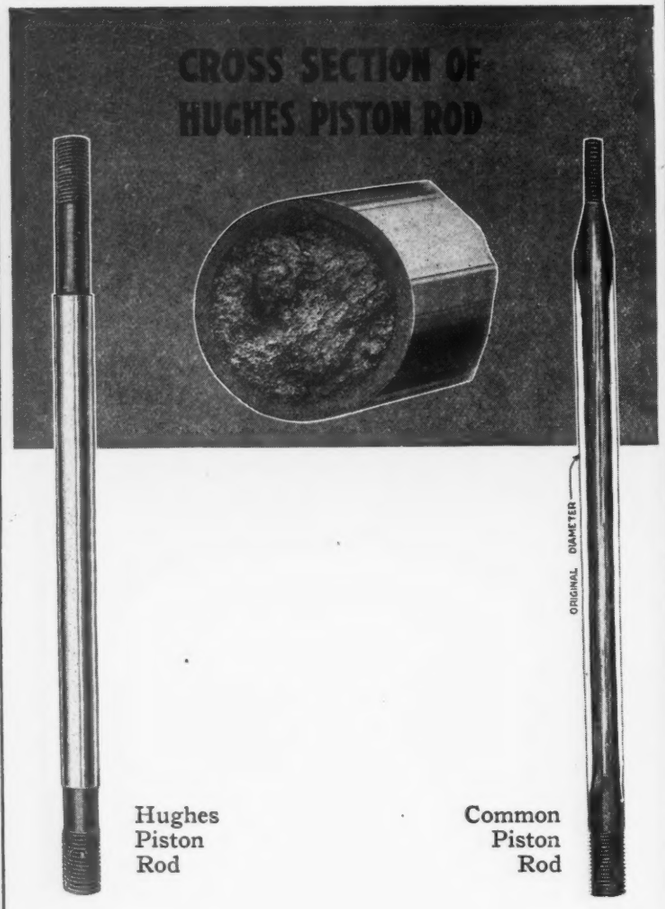

—after a few months' use

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This rod will last three to five times as long as rods of ordinary manufacture. Sand cannot cut it.

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Core is left soft and tough, so that the rod is not brittle. See cross secion.

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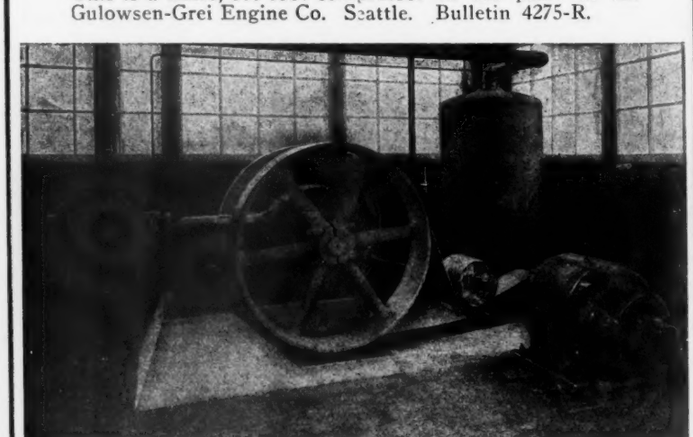

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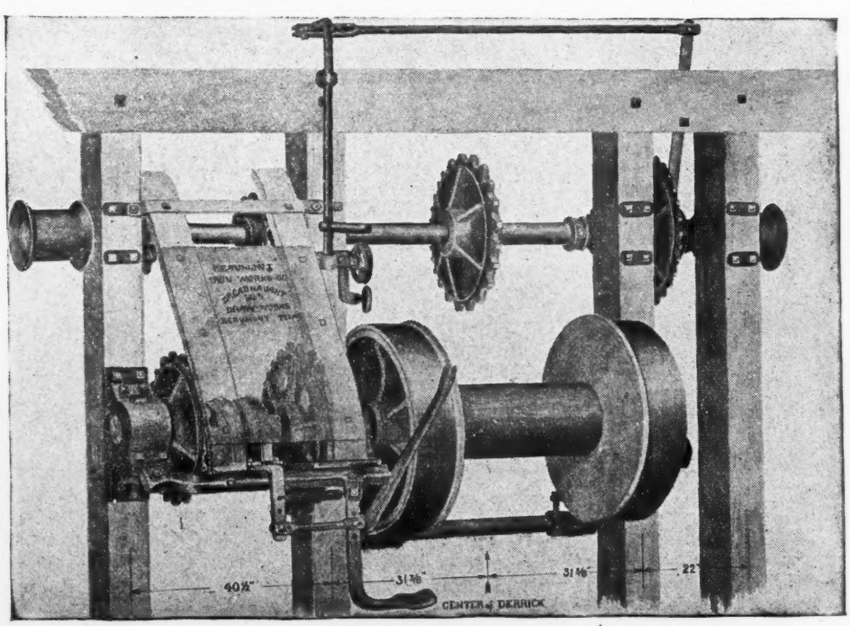

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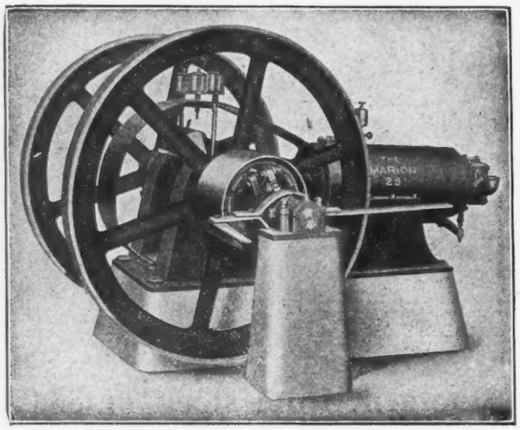

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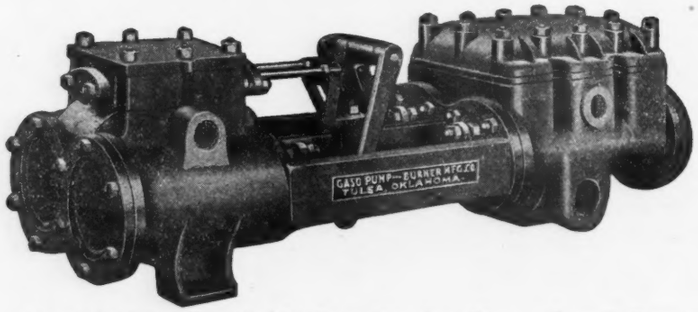

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5,000 ft. 10 inch 35 lb. Casing
1,000 ft. 10 inch 40 lb. Casing
1,500 ft. 12½ inch 50 lb. Casing
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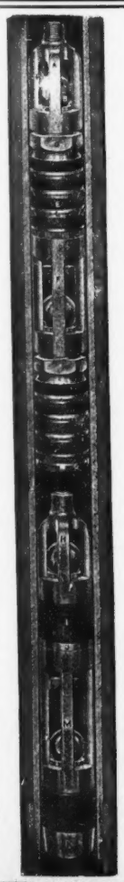

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Oil Well Supply Co.
Peden Iron & Steel Co.
Producers Sup. & Tool Co.
United States Rubber Co.

Packers
Layne & Bowler.
Robinson Packer Co.
The Guiberson Corp.

Paints
Peden Iron & Steel Co.

Pipe
American Mach. & Sup. Co.
Beaumont Iron Works
A. M. Byers Co.
F. W. Heitmann Co.
Frick-Reid Supply Co.
Independent Pipe Co
Interstate Pipe Co.
Keystone Pipe & Supply Co.
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United Iron Works

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Union Petroleum Co.
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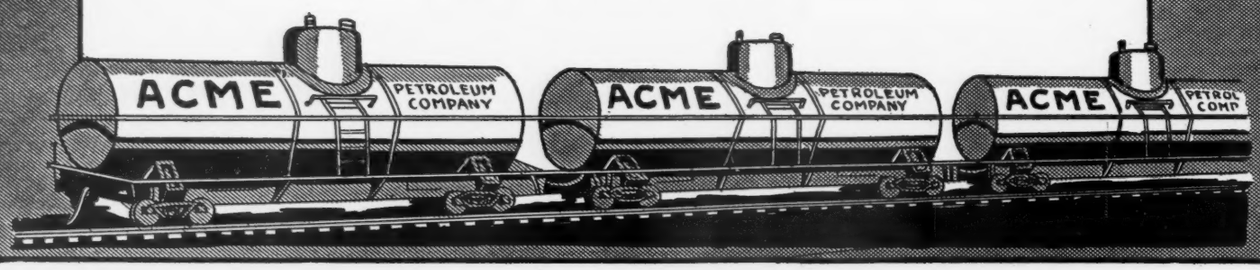

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